

NEW OR LITTLE-KNOWN CRANE-FLIES FROM THE UNITED STATES AND
CANADA: TIPULIDÆ, DIPTERA. PART 2.

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INTRODUCTION.

In the present paper, the author has undertaken a consideration of the American crane-flies contained in the collections of the Boston Society of Natural History and the Museum of Comparative Zoology at Cambridge. These collections are of peculiar interest to the student of crane-flies since they include the numerous types of Johnson, Osten Sacken, and Loew, in addition to a considerable amount of unclassified material. The paper has been divided into two parts, the first being a designation of the single-type specimen of the species of *Tipula* described by Loew, the second part a continuation of the first paper under this title.¹ I wish to express my deep appreciation to all of the persons who have kindly assisted me in this study, most of whom are designated in various parts of the paper. I am especially indebted to Mr. Charles W. Johnson and to Mr. Samuel Henshaw for the great privilege of examining and studying the invaluable collections in their custody.

PART 1. DESIGNATION OF THE SINGLE-TYPE (LECTOTYPIC) SPECIMEN
OF THE NORTH AMERICAN SPECIES OF TIPULA DESCRIBED
BY HERMANN LOEW.

The North American crane-flies described by Hermann Loew were included in a series of papers published between the years 1861 and 1872 under the general title of *Diptera America septentrionalis indigenæ* and appearing in the *Berliner Entomologische Zeitschrift*. This remarkable series of articles was in ten parts or centuries, each containing the description of a hundred species of flies. The references will be merely to the "Century," with the number of the species in the century and the original pagination. The date of the five centuries in which the crane-flies were described is as follows:

¹ PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, October, 1914, pp. 579-606.

- Century IV, vol. 7, Nos. 1-42; 1863.
Century V, vol. 8, Nos. 14-32; 1864.
Century VI, vol. 9, Nos. 2, 3; 1865.
Century VIII, vol. 13, No. 2; 1869.
Century X, vol. 16, Nos. 2, 3; 1872.

All of the North American crane-flies described by Loew in this series of articles belong to the subfamily *Tipulinae* and include the following genera: *Ctenophora* (1 species); *Longurio* (1 species); *Holorusia* (1 species); *Stygeropsis* (3 species); *Pachyrrhina* (19 species) and *Tipula* (41 species). The Loew material is all cotypic, there being no designation of a single-type specimen, and consequently the choosing of a lectotype at this time is deemed advisable. Concerning the Loew collection, as it is now preserved, it should be understood that the type-series for any species very often includes many specimens that were not mentioned by Loew in his original description, and yet there can be no doubt but that the material formed part of the type-series, since the specimens often bear the written label in Loew's script and the text of certain of the descriptions indicates that this material was before the author at the time that the description was drawn up. It has often seemed advisable to select one of these latter specimens as type, but this has not been done unless the actual specimen mentioned by Loew could not be located, as in the case of *Tipula angulata*. In all cases the male sex has been given preference over the female because of the varied characters of the hypopygium of this sex. Specimens that were placed in the series by Osten Sacken at the time that he arranged the material in the museum, but from the place and date were obviously not in Loew's hands at the time of the drawing up of the descriptions, have been ignored. It may be stated that the material in the Museum of Comparative Zoology, as regards the species of *Tipula*, is still largely unarranged except to the major divisions based on the wing-pattern, there being three large cases devoted to the *striatae*, *marmoratae* and *subunicolores*. When one studies the descriptions of the *Tipulae* described by Loew it is at once noted that only about six of the forty or more characterized are of the *subunicolores*, and this was explained when the collection was studied. The majority of the species described as new in the present paper, as well as most of the Eastern species named by Doane in 1901, were found in the collection, bearing manuscript names in Loew's writing but for some unexplained reason having never been described. In cases where this was feasible the name suggested by Loew is the

one that has been adopted. These manuscript names of Loew have appeared in various collections, or, in some cases (*bicornis*, *brevicollis*), even into the literature, and consequently it is deemed advisable to mention the name applied by Loew to the different species discussed in the second part of this paper.

TIPULA.

T. angulata, Century V, No. 22, pp. 61, 62.

The type-material was stated to have come from Massachusetts, but the only specimen now appearing in the collection is a male from New Hampshire, bearing the number 258, with the name-label in Loew's writing. It is this specimen that is designated as the type; there is a possibility that the locality labels were later confused or that Loew wrote down the wrong State in his original description. There is no reason whatsoever for doubting that the specimen was before Loew at the time he drew up the description. The paler specimen mentioned in a note by Loew is not of this species, but of *T. penobscot*, described later; the sex is not female, but male.

Lectotype, ♂, New Hampshire.

T. angustipennis, Century IV, No. 19, pp. 286, 287.

Seventeen specimens in the type-series; (1), ♂, Winnipeg (Kennicott); (2), ♂, No. 396, Labrador (Schneider); (3), ♀, No. 129, Connecticut; (4), ♂, Maine. Others in the series from Illinois; Hudsons Bay Territory (Kennicott); Lake Superior; Texas; Brunswick, Maine (Packard).

Lectotype, ♂, Winnipeg (Kennicott).

T. apicalis, Century IV, No. 2, p. 277.

Three specimens in the type-series; (1), ♀, bearing the name-label, Maine; (2), ♂, No. 254, without locality; (3), ♂, Dobbs Ferry, N. Y. The male sex is not included in the original description and therefore is not mentioned as type.

Lectotype, ♀, Maine (Osten Sacken).

T. appendiculata, Century IV, No. 20, p. 287.

The monotype only, a ♂, Saskatchewan (Kennicott).

T. balioptera, Century IV, No. 15, p. 284.

Three specimens in the type-series; (1), ♂ and ♀, together on the pin, the ♀ almost entirely destroyed by museum pests, only one wing remaining, English River, Canada (Kennicott); (3), ♂, labelled only "R. A. (Kennicott)."

Lectotype, ♂, English River (Kennicott).

T. bella, Century IV, No. 29, pp. 291, 292.

Nine specimens in the type-series; (1), ♂ ♀, No. 99, Connecticut, bearing the name-labels; (4), most of the specimens now without locality-labels (including the District of Columbia material mentioned in the original description).

Lectotype, ♂, Connecticut (Norton).

T. caloptera, Century IV, No. 30, p. 292.

Four specimens in the type-series; the specimen from Rhode Island mentioned in the original description of the species could not be traced; (1), ♂, No. 128, Massachusetts; (2), ♂ ♀, Illinois.

Lectotype, ♂, Massachusetts (Scudder).

T. canadensis, Century V, No. 19, pp. 59, 60.

The monotype only, a ♂, Fort Resolution, Hudsons Bay Territory (Kennicott).

T. casta, Century IV, No. 25, p. 289.

Two specimens in the type-series, from Pennsylvania.

Lectotype, ♂, Pennsylvania.

T. centralis, Century V, No. 21, pp. 60, 61.

The monotype only, a ♂, Hudsons Bay Territory (Kennicott).

T. cincta, Century IV, No. 24, pp. 288, 289.

Six specimens in the type-series; (1), ♂, No. 96, District of Columbia; (2), ♀, District of Columbia; (3), ♂, New Hampshire, bearing the label in Loew's writing; (4), one ♂, two ♀'s, New Hampshire.

Lectotype, ♂, District of Columbia (Osten Sacken).

T. discolor, Century IV, No. 12, p. 282.

The monotype only, a ♀, now without locality-label, but according to the original description, Massachusetts (Scudder).

T. eluta, Century IV, No. 27, p. 290.

The type is apparently no longer in existence. It was described from the District of Columbia (Osten Sacken).

T. fallax, Century IV, No. 10, p. 281.

The type-material is from California.

Lectotype, ♂, California (Agassiz).

T. fasciata, Century IV, No. 6, p. 279.

Six specimens in the type-series; (1), ♂, Sharon Springs, N. Y.; (2), one ♂, two ♀'s, No. 247, New York; (5), ♂, Palisades, N. Y.; (6), ♀, Cambridge, Massachusetts.

Lectotype, ♂, Sharon Springs, N. Y. (Osten Sacken).

T. fragilis, Century IV, No. 7, pp. 279, 280.

Two specimens in the type-series; (1), ♂, No. 7, Maine.
Lectotype, ♂, Maine.

T. fraterna, Century V, No. 14, pp. 56, 57.

The type is apparently no longer in existence. A label pinned in the case states: "I found the label loose in the drawer and could not refer it to any species. O. Sacken." The species was described from the District of Columbia (Osten Sacken).

T. grata, Century IV, No. 11, pp. 281, 282.

Six specimens in the type-series; (1), two ♂'s, District of Columbia (Osten Sacken); (3), ♂ ♀, New York.

Lectotype, ♂, District of Columbia (Osten Sacken).

T. hebes, Century IV, No. 18, pp. 285, 286.

Six specimens in the type-series; (1), ♂, the specimen bearing the name-label in Loew's writing lacks the locality-label, but is presumably the Connecticut specimen; (2), ♂, Wisconsin; (3), ♀'s, Illinois. The Maine material was not found.

Lectotype, ♂, Connecticut (Norton).

T. ignobilis, Century IV, No. 9, p. 280.

Two specimens in the type-series; (1), ♀, without locality-label, but presumably the specimen from the District of Columbia; the specimen is pinned with the cast pupal skin; (2), ♀, New Hampshire.

Lectotype, ♀, District of Columbia (Osten Sacken).

T. infuscata, Century IV, No. 26, pp. 289, 290.

Two specimens in the type-series; (1), the specimen bearing the name-label is broken and the sex is uncertain, but from the text of the original characterization it is presumed that the specimen is a female; (2), ♀, New York.

Lectotype, ♀, New York.

T. latipennis, Century V, No. 20, p. 60.

Three specimens in the type-series; (1), two ♂'s, one ♀, No. 249, New Hampshire.

Lectotype, ♂, New Hampshire (Osten Sacken).

T. longiventris, Century IV, No. 5, pp. 278, 279.

Five specimens in the type-series; (1), ♂, No. 6, Illinois, bearing the name-label; (2), a broken specimen from English River, Canada (Kennicott); (3), ♂, almost totally destroyed by Dermestids, the wings and a fragment of the thorax all that is left; the label says "Osten Sacken" without locality; (4), ♀, New York (Edwards)

with the apex of the abdomen broken off; the specimen bears the name-label in Loew's writing; (5), ♀, Maine.

Lectotype, ♂, Illinois (description says Osten Sacken, but probably Kennicott).

T. macrolabis, Century V, No. 17, p. 58.

Two specimens in the type-series; (1), ♂, No. 136, Fort Resolution (Kennicott) (2), ♂, labelled "Hudsons Bay Territory."

Lectotype, ♂, Fort Resolution, Hudsons Bay Territory (Kennicott).

T. pallida, Century IV, No. 16, pp. 284, 285.

Six specimens in the type-series; (1), ♂, No. 251, pinned above the cast pupal skin, Massachusetts; (2), ♂, Massachusetts; (3), ♀, New Hampshire; (4), sex uncertain, New Hampshire; (5), two ♂'s, without locality-labels, bearing the numbers 155, 162, respectively.

Lectotype, ♂, Massachusetts (Scudder).

T. præcisa, Century X, No. 2, p. 51.

The type-material is from California.

Lectotype, ♂, California (Hy. Edwards).

T. pubera, Century V, No. 16, pp. 57, 58.

The type-material is from California.

Lectotype, ♂, California (A. Agassiz).

T. septentrionalis, Century IV, No. 4, p. 278.

Three specimens in the series; (1), ♂, No. 394, Labrador; (2), two ♂'s, one bearing the name-label.

Lectotype, ♂, Labrador (Schneider).

T. serrulata, Century V, No. 18, pp. 58, 59.

The monotype only, a ♀, Fort Resolution, Hudsons Bay Territory (Kennicott).

T. sarta, Century IV, No. 14, p. 283.

Twelve specimens in the type-series; (1), ♂, No. 382, without locality-label, but probably from English River, Canada; (2), ♂, No. 18, without locality-label; (3) several others, English River, Canada (Kennicott); (7), other specimens, Winnipeg (Kennicott); (10), Massachusetts (Scudder), these latter specimens almost entirely destroyed by Dermestids.

Lectotype, ♂, English River, Canada (Kennicott).

T. speciosa, Century IV, No. 22, p. 288.

Six specimens in the type-series; (1), ♂, Illinois; (2), ♂, No. 256, District of Columbia; (3), ♂'s, New Jersey; (5), ♂, Kentucky,

this last specimen accompanied by a note "last joint of the antennæ very small in both ♂ ♀; 2nd joint of palpi = 3rd," in Osten Sacken's writing.

Lectotype, ♂, Illinois (description says Osten Sacken, but probably Kennicott).

T. strepens, Century IV, No. 28, p. 291.

Three specimens in the type-series: (1), ♀, No. 253, without locality-label, presumably New York; (2), two ♀'s, Palisades, New York (O. Sacken). The male of the original description could not be located.

Lectotype, ♀, New York (Osten Sacken).

T. subfasciata, Century IV, No. 13, p. 282, 283.

Two specimens in the type-series; sex uncertain, but the original description says ♂.

Lectotype, ♂, English River, Canada (Kennicott).

T. submaculata, Century IV, No. 23, p. 288.

Three specimens in the type-series; (1), ♀, Massachusetts; (2), ♀, No. 259, New York. The male was not included in the original description, but appears in the collection under the manuscript name "*bidens*."

Lectotype, ♀, Massachusetts (Scudder).

T. suspecta, Century IV, No. 8, p. 280.

The monotype only, a ♀, without locality-label; the description says District of Columbia (Osten Sacken).

T. tephrocephala, Century V, No. 23, p. 62.

Seven specimens in the type-series; (1), ♂, No. 180, bearing the name-label, New Hampshire; (2), ♀, New Hampshire; (3), ♀, Cambridge, Massachusetts; (4), ♀, Massachusetts; (5), sex?, Canada (Couper); (6), ♀, bearing name-label, Palisades, New York.

Lectotype, ♂, New Hampshire.

T. ternaria, Century V, No. 15, p. 57.

The monotype only, a ♂, No. 138, Hudsons Bay Territory (Kennicott). The label says "*terna*," but an accompanying note by Osten Sacken says "probably *ternaria* Loew," and there can be no question but this is the species. Under the manuscript name of "*triplex*" Loew has two more males from Hudsons Bay Territory, to which Osten Sacken has added the label "allied to *T. arctica* Curtis but the female ovipositor not serrated."

Lectotype, ♂, Hudsons Bay Territory (Kennicott).

T. tesselata, Century IV, No. 3, pp. 277, 278.

The monotype only, a ♀, Labrador (Schneider).

T. umbrosa, Century IV, No. 31, p. 292.

The monotype only, a ♂, Louisiana (Schaum).

T. valida, Century IV, No. 21, pp. 287, 288.

Eight specimens in the type-series; (1), ♀, No. 293, Illinois; (2), ♂, Virginia. The male sex is not mentioned in the original description. The Massachusetts specimens have lost the locality-labels.

Lectotype, ♀, Illinois.

T. versicolor, Century IV, No. 17, p. 285.

The monotype only, a ♀, Illinois, bearing the label "*versicolor* m."

PART 2. DESCRIPTION OF NEW OR LITTLE-KNOWN SPECIES.

Family **TIPULIDÆ**.

Sub-family **TIPULINÆ**.

Tribe **Tipulini**.

NEPHROTOMA Meigen.

Pales Meigen; Nouvelle Classification des Mouches, p. 14; 1800 (*nomen nudem*).

Nephrotoma Meigen; Illiger's Magazine, p. 262; 1803.

Pachyrrhina Macquart; Histoire Naturelle des Insectes; Dipteres I, p. 88; 1834.

The genus *Nephrotoma* was erected by Meigen in 1803 to include the Fabrician species, *dorsalis*. The insect mentioned, specimens of which are before me (Urdingen, Niederrhein, Germany; Riedel, collector), is a typical *Pachyrrhina* of the same group as *eucera* Loew (Nearctic). The venational details and the characters of the male hypopygium are altogether of the nature of those occurring in *Pachyrrhina*. Loew, in a foot-note to the characterization of *eucera* (*Berliner Entomologische Zeitschrift*, VII, Century 4, p. 297; 1863) states that if *Nephrotoma* is to be separated from *Pachyrrhina*, *eucera* should be referred to *Nephrotoma*. The antennæ of *eucera* and *dorsalis* are 19-segmented in the male; of *polymera*, 16-segmented in the male; of the majority of the species of the genus, 13-segmented in the male. Thus we see there is a very considerable range in the number of antennal segments, but the species included are all so very similar in the details of venation, in the male hypopygia and in their general habitus and body-coloration that they should not be separated, especially since the females show a very much lesser range in the number of antennal segments (13 to 15). A considerable

variation in the number of antennal segments is found in other genera of crane-flies (*Ctedonia*, 15 to 24 segments; *Cerozodia*, 32 to 39 segments; *Tanyderus*, 17 to 25 segments), and consequently too much significance should not be placed upon this variable character in these groups.

The genus *Pachyrrhina* was described at a much later date, and consequently the numerous species known throughout the world under this name must be referred to *Nephrotoma*. The change in the American species affects all of the described forms with the exception of *collaris* Say, *polymera* Loew, *nobilis* Loew, *unimaculata* Loew, *californica* Doane, *trinidadensis* Alexander and *macrosterna* Alexander, which should be referred to the genus *Tipula* as discussed below.

The discovery of an ultimate character to separate the species of *Nephrotoma* from those of *Tipula* is still largely a desideratum. There are a number of characters which, if used in combination, should serve to separate the species of the two genera. The majority of the characters cited below should hold in all cases. Venationally these characters are as follows:

(1) The very short, usually almost transverse, radial sector of *Nephrotoma*, which in many species is transverse and simulates a cross-vein; in other species longer and more oblique, reaching its maximum length apparently in species such as *vittula* Loew.

(2) The sessile cell M_1 in *Nephrotoma*, this being rarely short-petiolate. This character has long been known, having been clearly stated by Schiner (1864). Species of *Tipula* with the cell sessile are unknown.

(3) The basal deflection of Cu_1 and the cross-vein *m-cu* at or before the fork of *M*. This character, described for the first time by Czizek² and independently by Brunetti,³ is the nearest approach to absolute of any that we have, but even this is approached by some species of *Tipula* (the *marmorata* group, *fragilis* Loew, *ignobilis* Loew, *et al.*).

The male hypopygium of *Nephrotoma* shows the ninth pleurite never completely fused with the ninth sternite, the more generalized condition occurring in such species as *incurva* Loew, where the pleurite is almost entirely separated from the sternite, through *lugens* Loew, where the pleural suture is straight and not curved dorsally toward the tip, to the more specialized condition with the

² Tipulidæ Moraviæ; *Zeitschrift des Mährischen Landesmuseums*, vol. 11, p. 50, 1911.

³ *Fauna of British India*, Diptera Nematocera, p. 340, 1912.

curved suture obtaining in many species (*eucera* Loew, *ferruginea* Fabricius, *pedunculata* Loew, *et al.*). The ninth tergite is usually small and rather inconspicuous, not tumid. The outer pleural appendage is fleshy, in the shape of a more or less flattened lobe, which is sometimes attenuated or arcuated.

In general, the species of *Nephrotoma* are shiny with well-marked stripes and bright colors. In some, however (as *macrocera* Say), the colors are dull, quite as in some species of *Tipula*. The six species listed before, as well as the new species described below as *Tipula pachyrhinoïdes*, which have hitherto been taken to be species of *Nephrotoma*, agree with the species of this latter genus only in the bright, shiny coloration, all of the other characters pointing strongly to the fact that they are really species of *Tipula*. The second *Tipula californica* described by Doane⁴ thus requires renaming.

In the work by Czizek cited before,⁵ the author of this excellent paper has given a critical comparison of *Nephrotoma* and *Pachyrrhina*, pointing out the fact that there is no basis at all for retaining the latter name; but in spite of this clear comparison, the two names are still kept separate. The "discoïdal cross-vein" spoken of by the author is that portion of the vein *M* between the cross-vein *m-cu* and the fork of *M*.

Nephrotoma penumbra sp. n.

Frontal prolongation of the head with three stripes; antennæ dark brownish black, excepting the basal segment; head dull brownish; thoracic dorsum obscure dull yellow with three broad black stripes; pleura yellow spotted with brown; wings dusky; abdomen dull yellow with three stripes.

Male.—Length, 12.2–13.4 mm.; wing, 11.8–13.6 mm.

Frontal prolongation of the head moderate in length, yellow, with three broad brownish stripes, the lateral pair being more distinct than the median one. Palpi with the basal segment black, the second and third dark brown, the terminal segment light brown. Antennæ with the basal segment dull yellow, darkened toward the apex, the remaining segments dark brownish black; the flagellar segments deeply incised beneath. Front light yellow; vertex reddish brown with a linear black median vitta.

Thoracic præscutum dull obscure yellow with three broad black stripes, the median one longest and broadest; the lateral stripes not

⁴ *Annals of the Entomological Society of America*, vol. 5, p. 49, 1912.

⁵ *Tipulidæ Moraviæ; Zeitschrift des Mährischen Landesmuseums*, vol. 11, pp. 49, 51, 1911.

incurved at the anterior end; scutum dull yellow, the lobes with two dark brown spots on each; scutellum dull brownish yellow; postnotum rather bright yellow with a broad median vitta, which is widest in front, narrowed behind. Pleura yellow, the mesopleurites suffused with brown on the ventral portions of the sclerites. Halteres brown. Legs with the coxæ yellowish brown; trochanters and femora light brown; tibiæ and tarsi brown. Wings strongly tinged with brown, the stigma long, brown, the veins dark brown. Venation as in Plate XVI, fig. 1.

Abdominal tergites dull brownish yellow with a very broad blackish median stripe, the lateral margins of the segments indistinctly blackened, the caudal margin very narrowly pale; eighth and ninth tergites uniformly dark brown; sternites dull yellow, the segments three to seven with a linear black median mark, broadest basally; the mark on the seventh segment short, occupying less than half the length of the segment, the other marks long, occupying about three-fourths the length of the segment; sternites eight and nine almost uniformly brownish yellow. Male hypopygium with the ninth tergite broad, having the caudal margin provided with a deep U-shaped median notch, the lateral lobes broadly rounded.

Habitat.—Northeastern United States.

Holotype, ♂, Halfway House, Mt. Washington, N. H.; July 6, 1914 (Johnson).

Paratypes, 2 ♂'s, topotypic; 3 ♂'s, Mt. Washington, N. H. (Osten Sacken).

The type is in the collection of the Boston Society of Natural History; paratypes in the collection of the Museum of Comparative Zoology and in the collection of the author.

In its black thoracic stripes, *penumbra* agrees with *vittula* Loew, *pedunculata* Loew and *incurva* Loew, all being forms with the wings hyaline and not strongly infused with brown as in *penumbra*. The lateral præscutal stripes are not incurved at the tip as in *incurva* and there is no black spot between the bases of the antennæ as in *pedunculata*.

TIPULA Linnæus.

Tipula Linnæus; Systema Natura, 10th edition, p. 585; 1758.

TRICHOTIPULA subgen. n.

Similar to *Tipula*, s.s., the apical cells of the wings with abundant short hairs. The coloration of the type-form is very similar to species of the genus *Oropeza* Needham.

Type.—*Tipula* (*Trichotipula*) *oropezoides* Johnson.

This insect is very common and quite characteristic of the upland bogs, the gorges and deep, cold Canadian woods in May and June. From the tent-trap observations made in 1914 by Miss Ruby B. Hughes, at Ithaca, N. Y., it is quite certain that the larva lives in wet earth near water.

CINCTOTIPULA subgen. n.

Similar to *Tipula*, s.s., the apical cells of the wings with scanty short hairs. The coloration of the type-species is dark brown, the thoracic dorsum dark colored with pale stripes.

Type.—*Tipula* (*Cinctotipula*) *algonquin* sp. n.

Tipula algonquin sp. n.

Coloration brown and yellow; antennæ elongated in the male sex, the two basal segments dull yellow, the flagellum unicolorous, brown; thorax dark brown with three pale stripes; abdominal tergites light yellow, cross-banded with brown; wings hyaline.

Male.—Length, 11.5–12 mm.; wing, 11–11.3 mm.; antennæ about 5.5–6 mm. Fore leg, femora, 7.3 mm.; tibiæ, 8.7 mm.; hind leg, femora, 8 mm.; tibiæ, 8.6 mm.

Frontal prolongation of the head short, stout, brownish yellow, the nasus prominent; palpi short, the two basal segments paler brown than the two apical segments. Antennæ rather elongated in the male sex, the two basal segments dull yellow, the flagellar segments uniform dark brown with a dense white pubescence; segments of the flagellum only a little enlarged at the base. Head dull yellow, on the sides of the vertex behind the eyes with a triangular brown patch.

Pronotal scutum brownish yellow, a little darker medially. Mesonotal præscutum with the three usual thoracic stripes present, but pale brownish yellow in color, the interspaces being very dark brown, so that a pale striping on a dark background is effected; the middle stripe is divided by a broad median grayish brown stripe; lateral margins of the sclerite pale, yellow; scutum with the median area pale yellow pollinose; the lobes dark brown, enclosing two paler brown areas, of which the larger lies proximo-caudad; scutellum brownish yellow with a brown line on either side of the broad median area; postnotum dull brownish yellow. Pleura dull yellow, the mesepisternum more brownish. Halteres light brown, the knobs yellowish. Legs with the coxæ and trochanters dull yellow; femora dull yellow, indistinctly tipped with darker brown; tibiæ pale yellow at the joint, remainder of the tibiæ and tarsi dark brown.

Wings pale gray, the costal cell only a little more yellowish in color; a pale vitreous mark before the stigma, most distinct in the base of cell *1st R*₁, reappearing at the base of cell *1st M*₂; a white vitreous blotch beyond the stigma occupying the outer end of cell *2nd R*₁ and the base of *R*₂; stigma prominent, full, oval, dark brown; veins brown. Venation (see Plate XVI, fig. 2): *Rs* rather short, arcuated; cell *1st M*₂ elongate, narrow; a few hairs in the outer cells of the wing, in cells *1st R*₁, *R*₂, *R*₃, *R*₅, *M*₁ and *M*₂.

Abdominal tergites light yellow, segment two with a broad cross-band at about midlength; segments two to eight with a broad apical cross-band, giving the abdomen a banded tigrine appearance; on the shortened apical segments the banding occupies almost the entire sclerite; sternites one to four pale yellow, five to eight dark brown. Hypopygium with the eighth tergite large, the caudal margin almost straight. Ninth tergite (see Plate XIX, fig. 44) large, the caudal margin with a deep U-shaped notch, the margin provided with rather numerous hairs. Ninth pleurite extensive but incomplete, the pleural suture short, curved dorsad at its tip; pleural appendages (see Plate XX, fig. 61) two, an outer fleshy lobe, moderately long, provided with numerous hairs; inner lobe more complex, consisting of a flattened blade directed dorsad, at the base on the outer edge with a sharp chitinized tooth. Ninth sternite (see Plate XVII, fig. 24) rather restricted, along the ventral median line profoundly incised. Eighth sternite extensive, the caudal margin with a deep and broad U-shaped notch.

Habitat.—Northeastern North America.

Holotype, ♂, Station Isle, Go-Home Bay, Muskoka District, Ontario, Canada, August 16, 1912 (Clemens).

Allotype, ♀, Northeast Harbor, Hancock Co., Me., August 29, 1908 (Minot).

Paratypes, No. 1, ♂, with the allotype; No. 2, ♀, North Mt., Luzerne Co., Pa., August 28, 1897 (Johnson); No. 3, ♂, Ridgewood, Bergen Co., N. J., July 14, 1911 (Leonard); No. 4, 3 ♂, 2 ♀ near Plummer's Island, Fairfax Co., Virginia, July 28, 1912 (Knab); No. 9, Plummer's Island, Maryland, August 4, 1907 (McAtee).

The type is in the collection of the University of Toronto; the allotype in the collection of the Boston Society of Natural History; paratypes 1, 3, 7 and 8 in the collection of the author; paratype 2 in the collection of Mr. Johnson; Nos. 4-6, in the United States National Museum; No. 9 in the collection of the Biological Survey.

The specific name of this interesting fly is that of the great Indian

nation formerly occupying a large portion of the United States and Canada.

Tipula pachyrhinoides sp. n.

Size small (wing of the female under 12 mm.); thoracic stripes reddish to black; a broad median white band from the scutum to the base of the abdomen; abdominal tergites with the apices of the segments ringed with brown; wings with cell M_1 petiolate; cross-vein *m-cu* beyond the fork of M .

Female.—Length, 13.5 mm.; wing, 10 mm.

Frontal prolongation of the head shiny yellow with a linear brown mark on either side of the middle line and with a small rounded brown spot near the caudal end of this mark and slightly below it. Palpi dark brown. Antennæ with the two scapal segments dull yellow, the flagellum broken in the type (see the paratype described below). Head shiny orange-yellow with a dark brown median vitta, narrowest in front, broadened behind; a prominent frontal ridge on either side of the middle line, the anterior ends approximated; occiput with a rounded dark brown spot on either side of the middle line.

Pronotum with the scutum dull yellow, broadly darkened medially, sides of the sclerite and the proepisternum with a large brownish black blotch. Mesonotal præscutum yellow, shiny, with three reddish brown stripes, of which the middle one is broadened in front, narrowed behind, indistinctly bisected by a faint yellowish line; lateral stripes short and broad; pseudosutural foveæ present as a narrow impressed line connecting the impressed point with a blackened area on the sides of the sclerite; a large, rounded, blackish blotch at the ends of the transverse suture; scutum with the lobes brownish yellow, each with two large chestnut spots, of which the anterior one is smaller; median area broad, pale, almost white; scutellum slightly infuscated on the sides, the median area broadly whitish; postnotum with the medial third almost white, bordered on either side by a dark brown margin; lateral edges of the sclerite yellowish. Pleura pale china-white with an indistinct yellowish tinge; brown blotches as follows: large blotches on the anterior ventral portions of the mesepisternum and mesosternum; a smaller blotch on the anterior dorsal margin of the mesepimeron; a large blotch near the lower end of this last sclerite; the metapleural sclerites are broadly margined with dark brown; sternum with less distinct brown blotches; an impressed black semilunar line just in front of the parapterum. Halteres light brown, the knobs dark-

ened. Legs with the coxæ dull yellow, a little suffused with brown on the anterior outer face; trochanters yellowish brown; femora dull yellow, the tip narrowly dark brown; tibiæ dull yellowish brown, soon passing into dark brown; tarsi dark brown. Wings grayish subhyaline; stigma moderately indistinct, brown. Venation (see Plate XVI, fig. 3); R_s long; cell M_1 petiolate; basal deflection of Cu_1 and the cross-vein $m-cu$ beyond the fork of M .

Abdomen with the tergites brownish yellow, the caudal margin of each sclerite dark brown, sending a broad median line forward, forming a **1**-shaped mark; on the apical segments only the median vitta persists; lateral margins of the tergites with the anterior half grayish, the caudal half dark brown; an interrupted median line on the sternites.

The paratype is quite similar to the type with the following exceptions and additions: antennal flagellum dark brownish black; the thoracic stripes very dark brownish black with the ground-color light yellow; the pattern on the abdomen is indistinct but indicated.

Habitat.—Northern United States and Canada.

Holotype, ♀, Mt. Washington, N. H.

Paratype, ♀, Farewell Creek, Southern Saskatchewan, Canada; September, 1907.

The type is in the collection of the Boston Society of Natural History; the paratype is in the collection of the author.

This small *Tipula* bears a remarkable resemblance to certain species of *Nephrotoma*, especially *N. vittula* Loew, which is likewise a northern form. The thoracic stripes in *vittula* are described as being black, but specimens in the collection of the Boston Society of Natural History have the stripes rich reddish chestnut and are very similar to the present fly; the broad yellowish white median thoracic stripe, the transverse caudal brown margins to the abdominal tergites and the venation will easily distinguish the forms.

Tipula penobsco sp. n.

Coloration gray and brown; antennæ rather short, subunicolorous; thorax light gray, the stripes quite indistinct, brown; wings subhyaline, the tip broadly dark brown; an indistinct brown band along the cord; wings with the tip of vein R_2 atrophied or nearly so; male genitalia with the ninth tergite subquadrate, caudal margin deeply and broadly concave with a sharp median tooth; ninth pleurite small, complete.

Male.—Length, 11 mm.; wing, 12.8 mm.; antennæ about 3.3 mm.

Frontal prolongation of the head rather long, yellowish brown;

palpi light brown, the terminal segment darker. Antennæ with the four basal segments light yellow, the remainder light brown, the basal swelling of each segment only a little darker than the remainder of the segment. Front with a small tubercle; head light gray with a very narrow brown line extending from the middle of the tubercle caudad to the occiput.

Thoracic dorsum light gray with rather indistinct brown stripes, the median stripe broader in front, narrowed behind, indistinctly split by a pale middle vitta; lateral stripes narrower and less distinct; scutum pale grayish white, the middle portions of the lobes brown; postnotum and scutellum dull yellow, rather thickly dusted with grayish white. Pleura rather pale grayish white. Halteres pale, the knob brown. Legs with the coxæ pale dusted with whitish; trochanters pale yellow; femora dull yellow passing into brown toward the tip; tibiæ and tarsi brown. Wings whitish subhyaline, the costal cell more yellowish; tip of the wing broadly dark brown; an indistinct interrupted brown cross-band from the stigma along the cord; a brown cloud at the origin of R_3 , at the arculus, at two-thirds the length of cell M . Venation (see Plate XVI, fig. 4): tip of R_2 atrophied.

Abdominal tergites dull yellow with a median brown longitudinal line on the first segment; remaining tergites yellowish brown, segment seven and the caudal portions of six largely dull yellow; segment nine dark brown. Sternites dull yellow, segments six to nine more brownish. Male genitalia (see Plate XVIII, fig. 32) with the eighth tergite narrow. Ninth tergite (see Plate XIX, fig. 45) subquadrate, the caudal margin deeply and broadly concave, a blunt, rounded lobe on either side of this concavity, a sharp median tooth and a smaller denticle midway between the median tooth and the rounded lobe. Ninth pleurite rather small, complete, the dorso-caudal margin produced into a sharp point which is directed caudad; the ventro-caudal portion rounded and provided with abundant rather long hairs; pleural appendages two, the outer appendage a slender, small, fleshy lobe, subsigmoid to cylindrical in shape; the inner pleural lobe is complex, consisting of a large, flattened portion which is produced in front into a moderately sharp point which is directed cephalad; underneath the base of this point on the anterior or cephalic margin is a black, chitinized lobe which is directed laterad; the base of this appendage is hollowed out into a conspicuous cup-shaped lobe which is directed laterad and bears a small, sharp spine behind and beneath.

Habitat.—Northeastern United States.

Holotype, ♂, Orono, Penobscot Co., Maine, June 14, 1913 (Alexander).

Paratype, No. 1, ♂, North Mt., Luzerne Co., Pa., June 11 (Johnson); paratype No. 2, ♂, without locality, labelled "Packard" and the label "*angulata* = 258" in Loew's writing; this is the specimen mentioned by Loew in the description of *angulata*.

The type is in the collection of the author; paratype No. 1 in the collection of Mr. Johnson; paratype No. 2 in the collection of the Museum of Comparative Zoology.

The second paratype is quite pale in color, and this may be due to the general condition of the fly.

The specific name is that of the Indian tribe formerly occupying a large portion of the State of Maine.

This species was taken in a small woodland at Orono, Maine. These woods are Canadian in aspect, the main floral constituents being coniferous trees, *Abies*, *Picea*, *Tsuga* and *Thuja* and the ground cover of *Coptis trifolia*, *Linnaea borealis americana*, etc. The insect occurred along a small stream flowing through rather low ground and supporting a very rich crane-fly fauna. Most of the species were swept from boughs of trees, fern growth, etc., or caught in flight or swarming. The more conspicuous species on this day were *Dicranomyia pudica*, *D. haretica*, *D. halterata*, *D. pubipennis*, *Limnobia solitaria*, *Rhypholophus meigeni*, in small swarms, *R. rubellus*, in very large swarms, *Erioptera venusta*, *E. vespertina*, *Gonomyia subcinerea*, *Epiphragma fasciapennis*, *Limnophila rufibasis*, *L. brevifurca*, *L. fuscovaria*, *L. quadrata*, *Adelphomyia minuta*, *Rhaphidolabis flaveola*, *Tricyphona calcar*, *T. inconstans*, *Liogma nodicornis*, *Dolichopeza americana*, *Nephrotoma macrocera*, *Tipula bella* and *Tipula (Trichotipula) orozeoides*.

Tipula angulata Loew.

Tipula angulata Loew; Berliner Entomologische Zeitschrift, vol. 8, p. 61 (1864).

Tipula decora Doane; Journal of the New York Entomological Society, vol. 9, p. 125 (1901).

The synonymy as given above was decided upon after comparing the description of *decora* with the type of *angulata*. In the collection of Mr. Johnson there is a specimen of *angulata* that is from the same locality and taken by the same collector as the type of *decora* (male, Montreal, Canada, June 11, 1909, Chagnon).

Tipula fragilis Loew.

Tipula fragilis Loew; Berliner Entomologische Zeitschrift, vol. 7, p. 279 (1863).

Tipula suspecta Loew; Berliner Entomologische Zeitschrift, vol. 7, p. 280 (1863).

The synonymy as given above was decided after comparing the type of *suspecta* with those of *fragilis*.

Tipula mainensis sp. n.

Coloration brownish; thorax striped with blackish brown; antennæ with the three basal segments light yellow, the remaining segments bicolorous; wings pale grayish, stigma brown; male genitalia with the ninth tergite having the caudal margin broadly concave, the lateral angles not prominent.

Male.—Length, 10–11 mm.; wing, 12–12.1 mm.

Frontal prolongation of the head rather short, dull brownish yellow; nasus prominent, brown; palpi short, the first segment yellow, the remaining segments dark brown. Antennæ rather short, the three basal segments light yellow, the following segments with the basal swelling dark brown, the remainder of each segment dull yellow, passing into brown on the terminal segments. Head light yellowish brown, heavily whitish gray pruinose, with a narrow, indistinct brown median line.

Pronotum dull yellow. Mesonotal præscutum rather bright brown with heavy dark brown stripes, very sparsely dusted with yellowish, the lateral margins brighter, yellowish; scutum with the lobes largely brown on the disk; scutellum and postnotum dull yellow. Pleura dull yellow, whitish pollinose. Halteres with the knob dark brown, the extreme base, or sometimes the whole stem, yellowish brown. Legs with the coxæ light yellow, whitish pollinose; trochanters yellow; femora dull yellow, the tip narrowly dark brown; tibiæ brownish yellow, darker at the tip; tarsi brown. Wings pale grayish, the costal region a little brighter, more yellowish; stigma rather distinct, brown; a broad vitreous band before the stigma extending into the base of cell M_4 . Venation as in Plate XVI, fig. 5.

Abdominal tergites dull yellow, a narrow median band which is broadened out on the apical segments; a brownish subbasal blotch on the side of each segment; the lateral margin of the tergites pale; ninth tergite brownish black, narrowly bordered with yellowish; sternites yellowish. Male genitalia (see Plate XVIII, fig. 31) with the ninth tergite (Plate XIX, fig. 46) broadly subquadrate, the caudal margin very shallowly concave, the lateral angles not promi-

ment; a narrow impressed median furrow which is lined with whitish. Ninth pleurite complete, elongate oval, not in contact with the tergite; outer appendage a short, cylindrical, rather stout, fleshy lobe with rather numerous long hairs; inner appendage (see Plate XXI, fig. 76) complex, a very compressed lobe which is notched on its inner face and here heavily chitinized. Ninth sternite extensive, gently concave beneath on the caudal margin; on either side just ventrad of the pleurites with a large pale oval lobe which is densely punctulate on the outer ventral half. The penis-guard (see Plate XXI, fig. 75) is prominent, the tip a little expanded, consisting of a rounded apical lobe subtended on either side by a sharp, chitinized tooth. Eighth sternite almost straight across the caudal margin; on either side a V-shaped group of stout, conspicuous hairs, there being about 24-30 in each group.

Habitat.—Northeastern United States and Canada.

Holotype, ♂, Mt. Desert Isle, Hancock Co., Me., August 31, 1913 (Alexander).

Allotype, ♀, Fort Kent, Aroostook Co., Me., August 19, 1910 (Johnson).

Paratypes, No. 1, 2 ♂'s, Ashland Junction, Aroostook Co., Me., August 16, 1910 (Johnson); No. 3, ♂ ♀, Grand Lake, Newfoundland, July 25, 1906 (Bryant); No. 5, ♂, no locality, labelled "Packard."

Paratype No. 5 bears the manuscript name "*lavigata*" in Loew's script.

The type and paratype No. 4 in the collection of the author; the allotype and paratypes 1 to 3 in the collections of Mr. Johnson and the Boston Society of Natural History; paratype No. 5 in the Museum of Comparative Zoology.

Tipula taughannoek sp. n.

Coloration grayish and yellow; antennæ elongated in the male sex, the three basal segments dull yellow, the flagellum unicolorous, brown; thoracic dorsum yellowish with brown stripes; abdomen yellow with brown markings; wings hyaline or nearly so; male genitalia with the ninth tergite tumid, deeply notched; ninth pleurite nearly complete. Female with the coloration dark brownish black; wings uniformly brown; abdominal tergites with bright yellow triangles.

Male.—Length, 15-17 mm.; wing, 15.5-15.8 mm.; antennæ, about 10 mm. Fore leg, femora, 8.3 mm.; tibiæ 10.6 mm.; hind leg, femora, 8.8 mm.; tibiæ, 11.9 mm.

Female.—Length, 15 mm.; wing, 10.5–11.8 mm. Middle leg, femora, 4.9 mm.; tibiæ, 4.5 mm.; hind leg, femora, 6.3 mm.; tibiæ, 6.6 mm.

Frontal prolongation of the head rather short, brownish yellow with sparse black hairs above; nasus distinct; palpi with the first two segments dull yellow, the apical segments darker. Antennæ long, graceful, if bent backward extending about to the base of the fifth abdominal segment; the three basal segments dull yellow, the remaining segments dark brown, uniform or nearly so. Front with a tubercle, grayish passing into brown on the vertex and thence into buff on the occiput; frontal tubercle buff; a narrow black median vitta from this latter becoming indistinct about the middle of the vertex.

Pronotum dull yellow to brown. Mesonotal præscutum dull grayish yellow with three distinct dark brown stripes, the median one broadest, the lateral stripes small and less distinct; scutum pale yellow laterally, duller yellow medially, the centre of the lobes mostly dark brown; scutellum and postnotum dull yellow, whitish pollinose. Pleura pale yellow, whitish pollinose, with brown markings before the base of the halteres, on the mesepisternum and mesosternum; metanotum brownish. Halteres light yellow, the knob dark brown. Legs with the coxæ pale whitish pollinose, the cephalic faces more or less suffused with brown, especially on the hind legs; trochanters and femora yellow, the latter narrowly dark brown at the tip; tibiæ brownish yellow passing into dark brown at the tip; tarsi dark brown. Wings pale yellowish brown, subhyaline, the costal region more yellowish, the stigma more brownish but indistinct; an interrupted vitreous band from before the stigma into cell *1st M*₂; a vitreous spot beyond stigma in the base of cell *R*₂ (see Plate XVI, fig. 8).

Abdomen with the first tergite silvery pollinose basally, bright yellow on the terminal two-thirds; tergites two to four dull yellow, each segment with a black median triangle, the point of which is behind; segment two with a dark brown ring about midlength of the sclerite; segments three and four with this transverse ring subbasal; lateral margins of these segments broadly pale yellow, inside which is a broad dark brown band running the length of the abdomen; segments five to seven dull yellow with the dorsal triangles and the lateral pattern extensive, largely covering the segments; the black lateral stripes end at the base of segment seven, so this segment is largely yellowish on the sides; segment eight dark brown except

the caudal margin on the sides; ninth tergite dark brown, the caudal margin broadly dull yellow; hypopygium reddish; sternites yellowish, on segments four to eight becoming much darker, the caudal margin broadly paler, more yellowish. Hypopygium (see Plate XVIII, fig. 33) with the ninth tergite (see Plate XIX, fig. 47) thickened, tumid, with a very deep shield-shaped notch continuing back almost one-half the length of the sclerite, the lateral lobes rather pointed; a prominent point on the middle line beneath, this directed caudad. Ninth pleurite (see Plate XX, fig. 62) rather extensive, nearly complete, the caudal margin produced caudad into a prominent lobe; a subtriangular fleshy lobe (*a*) from the caudal margin of the pleurite beneath, this lobe densely covered with prominent setiferous papillæ directed caudad and laterad; pleural appendages consisting of an outer, rather larger, cylindrical, pale fleshy lobe which is provided with numerous long hairs; inner appendage complex, consisting of a broad, pale, flattened and very compressed lobe, suboval, with the cephalic outer margin produced outward as a black, more chitinized bar which is connected with the main lobe only at its base. Ninth sternite deeply divided by a profound cut in which hang two pendulous lobes from the ventral inner portions of the ninth pleurite, these lobes with numerous long hairs at the tip only. Eighth sternite almost straight across the caudal margin. Penis-guard very complex, ventrally near the tip with two sharp straight points on each side; anal tube prominent, pale.

Female.—Frontal prolongation of the head rather short, brown; palpi short, dark brown. Antennæ short, the two basal segments rich brown, flagellum dark brown, unicolorous. Head rich brown, an indistinct dark brown median vitta.

Thoracic dorsum light brown with three dark brown stripes which practically conceal the ground-color, the middle stripe very broad in front, narrowed behind; scutum, scutellum and postnotum dark brown. Pleura brown, rather lighter on the dorsal pleurites. Halteres rather short, slender-stemmed, dark brown. Legs short, stout, dark brown throughout. Wings uniformly brown; stigma oval, dark brown; veins dark brown. Venation of this sex as in Plate XVI, fig. 7.

Abdominal tergites one to seven largely bright yellow above, the lateral margins dark brown; on the apical segments the yellow is in the form of triangles whose point is at the base of the segment; eighth and ninth segments dark brown; sternites rather dull yellow, variegated with dark brown. Ovipositor with the tergal valves

rather enlarged at the base, very slightly upturned at their tips; sternal valves short, straight.

Habitat.—Northeastern United States.

Holotype, ♂, Buell Mt., Fulton Co., N. Y., altitude 1,800 feet, June 13, 1914 (C. P. and W. P. Alexander).

Allotype, ♀, Southern Helderburg Mts., Albany Co., N. Y., near New Salem, June 12, 1915 (Alexander).

Paratypes, No. 1, 100 ♂'s, 3 ♀'s, with the allotype; No. 104, ♂, Taughanock Falls, Tompkins Co., N. Y., May 19, 1911 (Alexander); No. 105, ♂, Mt. Equinox, Bennington Co., Vt., June 5, 1910 (Johnson); No. 106, ♂, without locality, labelled "O. Sacken"; No. 107, ♀, Lake Forest, Lake Co., Illinois, May, 1905 (Needham); No. 108, ♀, Delaware, June 3, 1874; No. 109, ♂, in copulation with the last.

The type, allotype, and paratypes 1-104 are in the collection of the author: No. 105 in the collection of the Boston Society of Natural History; Nos. 106, 108, and 109 in the Museum of Comparative Zoology; No. 107, in the collection of Cornell University.

The type of this beautiful fly was taken on the shaded eastern slopes of Buell Mt., one of the southern peaks of the Adirondacks. It occurred in the hardwood forest which clothes the mountain, in the neighborhood of small granitic cliffs and near the dried-up bed of a mountain torrent. Crane-flies which were flying with this species included *Limnobia einctipes*, *L. indigena*, *Limnophila munda*, *L. areolata*, *L. toxoneura*, *Tipula pallida*, *T. valida* and both sexes of *T. fuliginosa*.

The paratype No. 104 was taken in the great gorge of the Taughanock Falls near Cayuga Lake, N. Y. The insect occurred at the summit of the talus slopes in a place wet with the falling spray of small accessory streams; the more notable plants in this portion of the gorge and growing at the top of the shale at this season are *Pinguicula vulgaris*, *Primula mistassinica* and *Saxifraga aizoides*.

Tipula fuliginosa Say.

Tipula fuliginosa Say; Journal of the Academy of Natural Sciences of Philadelphia, vol. 3, p. 18, 1823 (*Ctenophora*).

Tipula speciosa Loew; Berliner Entomologische Zeitschrift, vol. 7, p. 288, 1863.

Perhaps the most striking result of the study of American crane-flies during the past few years has been the discovery that the *Tipula speciosa* Loew is the male sex of *fuliginosa* Say. The evidence that this is the case has been slow in accumulating, but is now so con-

clusive that the condition can be stated definitely at this time. The males (*speciosa*) are very light colored, yellowish; the females (*fuliginosa*) are dark brownish to almost black. This is the first case of dimorphism in the Tipulidæ that has come to my notice, but the related species, *jejuna* Johnson and *taughannock* sp. n., certainly belong here.

This evidence of dimorphism in the species that is before me is as follows: a male and a female, taken in copulation, collected at Ira, Summit Co., Ohio, by James S. Hine. A male and a female secured in copulation and actually pinned while still "in coitu," collected at light, Boston, Mass., June 1, 1914, by H. M. Parshley. The final evidence is the finding of two crane-fly pupæ in the débris beneath the nest of a turkey vulture, on Jacksons Island, Md., May 23, 1913, by Messrs. Barber and Shannon. The material was taken to the laboratory, and both specimens emerged on May 23, 1913, one a male *speciosa*, the other a female *fuliginosa*!

On June 13, 1914, on Buell Mt., Fulton Co., N. Y., the males of this fly were common on the mountain side in the open shady woods. One female was taken. The males were usually found flying up a tree-trunk, beginning low down near the base of the tree, ascending by a partly flying, partly climbing motion. They were undoubtedly searching for the retiring females, as has been observed in other woodland-inhabiting species, as *fragilis* and others.

Tipula hermannia n. n.

Tipula fasciata Loew; Berliner Entomologische Zeitschrift, vol. 7, p. 279, 1863 (non *Tipula fasciata* Linnaeus, 1767).

The Loewian name, *fasciata*, is a primary homonym of that of Linnaeus, and the species is herewith changed as above. The insect is very common and widely distributed throughout the Eastern United States and Canada.

Tipula kennicotti sp. n.

Coloration grayish; thorax with a single very narrow median brown stripe; wings pale brown with a vitreous band before the cord; male hypopygium with the ninth tergite nearly if not quite fused with the sterno-pleurite; caudal margin of the tergite with a two-lobed median process; pleural appendages, two large flattened fleshy lobes on each side; sternal region profoundly incised; eighth sternite unarmed.

Male.—Length, 13 mm.; wing, 14 mm. Fore leg, femora, 7.3 mm.; tibiæ, 9 mm.; middle leg, femora, 8.5 mm.; tibiæ, 8.8 mm.

Frontal prolongation of the head short and high, light brown, the

nasus very long and slender, reddish brown. Palpi dark brown. Antennæ rather elongated in the male, the scape yellowish brown, segments three to five with the base of a paler brownish yellow than the remainder of the segment, the terminal flagellar segments uniformly brown; segments of the flagellum with a short basal enlargement which is about one-third of the length of the segment. Head light gray.

Pronotum pale brown, the scutellum deeply divided medially by an impressed black line which ends on the caudal margin of the scutum. Mesonotal præscutum brownish gray without distinct stripes excepting the single very narrow median vitta which runs to the suture; scutum with the lobes dark gray, the median area paler, brown; scutellum pale yellowish white with a sparse light gray bloom; postnotum light gray with a delicate impressed median line on the caudal half. Pleura clear light gray. Halteres brown. Legs not elongated as in the closely allied *perlongipes* Johnson, with the coxæ pale brown with a sparse grayish bloom; trochanters and femora yellow, the latter narrowly dark brown at the apex; tibiæ light brown, the terminal portion dark brown; tarsi yellowish brown. Wings light brown, the costal region more yellowish; the stigma pale brown; a vitreous band before the cord extending into cell *1st M*₂; vein *Cu* and its branches indistinctly scamed with brownish. Venation: *Rs* long; cross-vein *m-cu* at the fork of *M*, very long and prominent (see Plate XVI, fig. 6).

Abdomen with the first tergite grayish, the remainder dark brown; segments three to five with the caudal margin conspicuously pale silvery; tergite three with a broad basal band destitute of hairs and including a transverse rectangular area that is provided with large, coarse punctures; this does not occur on the succeeding tergites; sternites brown, the lateral margins and the apices a little more yellowish. Hypopygium (see Plate XVIII, fig. 34) as in *perlongipes* Johnson, *sulphurea* Doane, *et al.*, the ninth tergite practically fused with the sterno-pleural region into a continuous ring; there is a very indistinct groove between the tergite and sternopleurite; region of the ninth tergite (see Plate XIX, fig. 48) small, the caudal margin straight across or nearly so with a very broad median lobe which is weakly divided by a U-shaped median notch; viewed from the side, this median lobe is high and prominent, the caudal end blackened, spiculose. Ninth sterno-pleurite extensive, the pleural suture indicated beneath, the pleural region cylindrical, produced caudad; outer pleural appendage a flattened, subrectan-

gular lobe with a small lobule on the ventral outer edge, this appendage pale and covered with a dense, pale pubescence; the inner appendage is also pale and fleshy, arising from the apex of the pleural region just inside the outer pleural appendage; this appendage is darker colored, thicker, reddish yellow; from the notch between the pleurite and the sternite arises a flattened, chitinized appendage. Ninth sternite divided to the very base by a split which widens out behind. Eighth sternite unarmed.

Habitat.—Arctic America.

Holotype, ♂, Fort Resolution, Hudsons Bay Territory, Canada (Kennicott).

The type is in the collection of the Museum of Comparative Zoology where it bore the manuscript name of *tetra* in Loew's writing. This species is dedicated to the intrepid Arctic explorer and collector, Robert Kennicott.

This species can be confused only with the more southern *perlongipes* Johnson, from which it may be separated by the following key:

1. Antennæ bicolorous; thorax pale yellow with three brown stripes, the lateral pair less distinct than the median one; legs long (male, fore leg, femur, 10 mm.; tibia, 11.8 mm.; middle leg, femur, 11.3 mm.; tibia, 11.5 mm.); male hypopygium with the median lobe of the ninth tergite entire or the bifid nature barely indicated; outer pleural appendage long and narrow, narrowed at both ends; ninth sternite extensive, deeply incised, the margins of the incision closely appressed forming a carinate ridge (Eastern United States).....*perlongipes* Johnson.⁶
- Antennæ unicolorous or nearly so; thorax gray with a single delicate brown line; legs short (male, fore leg, femur 7.3 mm.; tibia, 9 mm.; middle leg, femur, 8.5 mm.; tibia, 8.8 mm.); male hypopygium with the median lobe of the ninth tergite bifid; outer pleural appendage broad, subrectangular; ninth sternite deeply incised, the margins merely approximated, not carinate (Arctic America)*kennicotti* sp. n.

Tipula piliceps sp. n.

Coloration blue-gray with brown markings; body with abundant pale hair.

Female.—Length, 14.5 mm.; wing, 16 mm.

Frontal prolongation of the head dark bluish brown, the nasus distinct. Palpi short, brownish black. Antennæ dark brownish black. Head bluish gray with a broad brown median stripe.

⁶ *perlongipes* Johnson; *Proceedings of the Boston Society of Natural History*, vol. 34, No. 5, p. 131; 1909.

Pronotum blue-gray, indistinctly brownish medially and on the sides. Mesonotal præscutum blue-gray with distinct rich brown stripes, the median one split by a narrow ground line; the lateral stripes broadly centered with the ground color; scutum gray, the lobes marked very indistinctly with brown; scutellum and postnotum gray infuscated with blackish, the former medially, the latter as a patch on either side. Pleura clear gray, the dorsopleural membranes yellowish brown. Halteres short, yellowish brown, the knobs a little darkened. Legs with the coxæ clear light gray; trochanters brownish black; femora dull yellow, the apex broadly brown; tibiæ brown, more yellowish on the basal third; tarsi dark brown. Wings subhyaline with a slight gray tinge; the stigma is oval, dark brown; a very faint brown tinge along vein *Cu* and its deflection; costal cell not brightened; a large vitreous spot before and beyond the stigma. Venation: *Rs* long, almost straight, as long as or slightly longer than *R*₃, but shorter than *R*₄₊₅; cell *M*₁ short petiolate, this petiole a little shorter than cross-vein *r-m*; cross-vein *m-cu* punctiform.

Abdominal tergites dull gray with three narrow brown lines which are almost continuous; the lateral margins of the sclerites are broadly pale yellowish, this extending to and including segment seven; segments eight and nine uniformly dark. Sternites light gray, the segments margined with yellowish, laterally very broad, caudally very narrow. Ovipositor (see Plate XXI, fig. 85) very small, the last segment narrowed, the upper valves small, flattened, transverse in position, the base broadened tapering to the acute apex, the valves divaricate; lower valves short, somewhat fleshy.

The fly is provided with abundant long white hair, on the head, thorax, coxæ and somewhat shorter and more appressed hairs on the abdominal tergites.

Habitat.—Arctic America.

Holotype, ♀, Hudsons Bay Territory (Kennicott).

The type is in the collection of the Museum of Comparative Zoology. The insect is part of the Loew collection and the name adopted above is a manuscript name of Loew's appearing on the pin.

This species is most closely allied to *Tipula besselsi* O. S. The types of the two species have been compared in the collection of the Museum of Comparative Zoology and the differences are as follows:

1. Color of the thorax dull light gray with four light brown stripes; median vitta of the head indistinct; dorsal abdominal vitta

narrow; eighth tergite with the margins flattened, conspicuously expanded; tergal valves of the ovipositor long, pale (Hudsons Bay Territory)..... *piliceps* sp. n.

Color of the thorax blue-gray with the stripes almost black, broad, and the median pair tending to become confluent; median vitta of the head distinct; dorsal abdominal vitta broader, more diffused; eighth tergite with the margins not conspicuously expanded; tergal valves of the ovipositor smaller (Northern Greenland; Polaris Bay)..... *besselsi* O. S.⁷

Tipula imperfecta sp. n.

Coloration grayish brown, the thoracic stripes indistinct; cell 1st M_2 open by the atrophy of the medial cross-vein.

Female.—Length about 11 mm.; wing, 10.5 mm.

Frontal prolongation of the head rather short, yellowish brown. Palpi brown. Antennæ with the basal segments dull yellow, the flagellum dark brown; antennæ rather long for this sex. Head dull gray with a narrow dark brown median vitta.

Pronotum dark grayish brown, the scutellum more yellow on the sides. Mesonotal præscutum dark grayish brown, the stripes in the type specimens indistinct; scutellum a little paler. Pleura with the mesopleuræ rather clear gray, the posterior pleurites dull light yellow. Halteres dull in color, the knobs darker brown. Legs with the coxæ dull yellow, suffused basally with grayish brown; trochanters brownish yellow; femora dull yellow, broadly dark brown at the apex; tibiæ similar, narrowly dark brown at the apex; tarsi brown. Wings light gray, the stigma yellowish brown; an indistinct vitreous band before the stigma. Venation (see Plate XVI, fig. 9).

Abdominal tergites dull brownish yellow, the caudal margins of the segments broadly pale; a broad dorso-median vitta consisting of broad V-shaped triangles on each segment, interrupted by the pale caudal margin to each segment; the apex of the triangle is in front; indistinct brown sublateral bands and a broad pale margin to the tergites; tergites seven to nine dark brown, excepting the narrow, pale, caudal and lateral margins; sternites dull yellow with a broad brown median band which is clearer on the terminal segments. The ovipositor has the ninth tergite (see Plate XXI, fig. 86) suddenly narrowed into a cylindrical rectangular plate, the dorsal valves of the ovipositor feebly chitinized, not serrated, lying transversely.

Habitat.—Eastern Canada.

⁷*besselsi* Osten Sacken; *Proceedings of the Boston Society of Natural History*, vol. 19, p. 42; 1876.

Holotype, ♀, Labrador (Packard).

Paratype, ♀, topotypic.

The types are in the collection of the Museum of Comparative Zoology. The specimens bear the number 395 and the manuscript name as given to the species, the label in Loew's writing.

The character of the open cell *1st M*₂ is almost unknown in this genus, but since both specimens show the character in both wings it seems that the manuscript name suggested by Loew is a good one. The *Tipula alta* Doane (*Annals of the Entomological Society of America*, V, 44, 1912) also shows this venational character.

Tipula cayuga sp. n.

Coloration gray or grayish brown, abdomen yellow; bases of the antennal flagellar segments dark brown, the segments constricted; male hypopygium with the ninth tergite having the caudal margin with a bifid median lobe.

Male.—Length, 15–18 mm.; wing, 16.8–18.5 mm.; fore leg, femora, 9.8 mm.; tibiæ, 11.8 mm.; middle leg, femora, 11.2 mm.; tibiæ, 10.8 mm.

Female.—Length, 24 mm.; wing, 21 mm.

Frontal prolongation of the head rather long, above grayish to almost white, passing into yellowish beneath; palpi brown. Antennæ rather short, scape and first flagellar segment light yellow; remaining segments of the flagellum dark brownish black at the base, the remainder of each segment being yellowish; the apical segments are more uniformly brown; the flagellar segments are deeply incised, the two ends being noticeably enlarged. Head with the front whitish, the vertex light gray, behind the eyes more suffused with brown.

Thoracic pronotum dull yellow. Mesonotal præscutum light gray or grayish brown with three distinct thoracic stripes, these stripes pale brownish yellow, distinctly and sharply margined with darker brown; scutum light gray, the anterior part of each lobe dark brown; scutellum and postnotum dull yellow, whitish pollinose. Pleura yellowish, thickly white pollinose. Halteres pale yellow at the base, brown at the tip. Legs with the coxæ yellow, densely white pollinose; femora yellow, a little darkened at the tip; tibiæ light brown soon passing into the dark brown of the remainder of the legs. Wings pale yellowish subhyaline to hyaline, the costal cell yellowish; a brown stigmal spot, more yellowish in front; a large vitreous spot before and behind the stigma; veins dark brown. Venation as in Plate XVI, fig. 10.

Abdomen yellow, the tergites two to eight with the caudal margin

blackish or grayish, black subterminally, the lateral margins broadly paler. Hypopygium with the ninth tergite (see Plate XIX, fig. 49) yellow caudally, black basally, with the caudal margin produced into two long lobes with the tips blackened, minutely spiculate. Ninth pleurite very extensive though incomplete, the pleural suture being indicated beneath, curved dorsad at the end; the ventral inner angle of the pleurite is densely clothed with long hairs; two pleural appendages (see Plate XX, fig. 63) the outer appendage flattened, broad, pale, the tip obtusely rounded; the inner appendage is complex, more chitinized, with a ventral arm (*v*) directed caudad and ventrad, its tip with a few scattered irregular teeth; the dorsal arm (*d*) deeply concave beneath. Guard of the penis long, slender, prominent.

Habitat.—Northeastern United States.

Holotype, ♂, Simmons Woods, Fulton Co., N. Y., June 9, 1914 (Alexander).

Allotype, ♀, Orono, Penobscot Co., Me., June 14, 1913 (Alexander).

Paratypes, No. 1, 3 ♂'s, topotypic; No. 4, "The Glen," Ithaca, Tompkins Co., N. Y., May 30, 1911 (Alexander); No. 5, 2 ♂'s, Orono, Penobscot Co., Me., June 14, 1913 (Alexander); No. 7, ♀, Ithaca, Tompkins Co., N. Y., reared, May 13, 1914; No. 8, 2 ♂'s, Indian Castle, Herkimer Co., N. Y., June 13, 1915 (Alexander).

The types are in the collection of the author.

The specific name is that of the Indian tribe, one of the Five Nations.

The type specimen was taken in Simmon's woods, Gloversville, N. Y., on June 9, 1914. It occurred along a small woodland stream supporting a rich vegetation with decided Canadian tendencies, the principal species being *Osmunda regalis*, *O. cinnamomea*, *O. Claytoniana*, *Onoclea sensibilis*, very large and sterile fronds of *Equisetum sylvaticum* and *E. arvense*, *Taxus canadensis*, *Streptopus roseus*, *Clintonia borealis*, *Smilacina racemosa*, *Medeola virginiana*, *Coptis trifolia*, *Ranunculus septentrionalis*, *Caltha palustris*, *Stellaria borealis*, *Dalibarda repens*, *Impatiens biflora*, *Viola cucullata* and *Senecio aureus*. The crane-flies associated with this species at this date were *Limnobia solitaria*, *Dicranomyia pubipennis*, *Adelphomyia minuta*, *Limnophila subcostata*, *L. rufibasis*, *L. tozoneura*, *L. recondita*, *L. fuscovaria*, *L. alleni*, *Ulomorpha pilosella*, *Tricyphona calcar*, *T. inconstans*, *Rhaphidolabis flaveola*, *R. rubescens*, *Liogma nodicornis*, *Cylindrotoma tarsalis*, *Oropeza venosa*, *Tipula collaris*, *T. lephrocephala*, *T. pallida*, *T. (Trichotipula) orozeoides* and *Xiphura frontalis*, a notable assemblage of northern or Canadian forms.

The insect was common on June 5, 1913, in a woody tract along the Stillwater Bayou, Orono, Me., where it occurred with *Dicranomyia liberta*, *Erioptera caloptera*, *E. armata*, and *Tipula bella*.

The fly was reared from a large aquatic larva found in the Indian Spring near Ithaca, Cayuga Lake, N. Y., where it occurred in the beds of water-cress (*Radicula nasturtium-aquaticum*) in company of other Tipulid larvæ, such as *Pedicia albobitta*, *Limnophila quadrata*, *Tipula abdominalis* and *T. bella*, as well as a host of the usual aquatic organisms. Other larvæ of this species, likewise strictly aquatic, were found in Coy Glen, Ithaca, N. Y., a rapid-flowing gorge stream.

Tipula triton sp. n.

Coloration light yellow; antennæ bicolorous; thoracic stripes reddish brown; abdomen with a series of about four conspicuous rounded brown spots along the sides; male hypopygium with the ninth tergite trifid; penis-guard subtended by two very large blade-like appendages which are drawn out apically into sharp points.

Male.—Length, 13.2–13.5 mm.; wing, 13.5–13.6 mm.

Frontal prolongation of the head rather long and slender, brownish yellow, the nasus distinct; palpi short, brown. Antennæ moderately long, the three basal segments dull yellow, the remaining segments of the flagellum with a distinct dark brown basal enlargement, the apex of the segments brownish yellow, on the terminal three or four segments more brownish. Head pale yellowish gray with an indistinct brownish subimpressed median line.

Thoracic dorsum light yellow with three indistinct light reddish brown stripes of which the median one is bisected by a narrow median ground vitta; the lateral præscutal stripes begin immediately behind the prominent pseudosutural foveæ; scutum dull light yellow, each lobe with two reddish brown spots which are approximated; scutellum and postnotum dull light yellow. Pleura yellowish, heavily whitish pollinose. Halteres rather short, the stem yellowish, the knob brown. Legs with the coxæ yellowish, whitish pollinose; trochanters yellow; femora yellow, the apex narrowly brown; tibiæ yellowish brown, the apex narrowly and very indistinctly darker; tarsi dark brown. Wings subhyaline with a faint brownish tinge, the costal cell more yellowish; the stigma large, light brown, indistinct; a narrow vitreous band before the stigma extending along the cord into cell 1st M_2 . Venation as in Plate XVI, fig. 11.

Abdominal tergites brownish yellow, the segments six and seven dark brown; eight yellowish, the ninth reddish; the apices of the segments are very narrowly ringed with silvery; on segments three

to six a conspicuous rounded brown spot on the sides of the segment near the base; sternites one to five yellow more or less suffused with brown, the terminal sclerites yellowish. Male hypopygium with the ninth tergite (see Plate XIX, fig. 50) rather prominent, flattened, the caudal margin with a broad and deep U-shaped notch and trifold, consisting of the flattened subacute lateral lobes and an acute median point; an indistinct median dorsal furrow. Ninth pleurite prominent, complete, rounded oval. The outer pleural appendage (see Plate XX, fig. 65) is situated near the end of the sclerite, strongly arcuated in the form of a boomerang, pale, covered with setigerous papillæ, the apex ending in a conical pale horny point. The inner pleural appendage (see Plate XX, fig. 66) is more chitinized, the apex heavily chitinized and blackened, deeply split into two lobes; around the notch on the inner face of the appendage is a group of about twelve prominent setigerous tubercles; a group of about four similar tubercles down the inner side of the appendage; outer face of this organ with several prominent subparallel ribs. The penis-guard viewed from the side (see Plate XXI, fig. 79) deeply bilobed by an oval-rounded notch; the ventral margin is produced into the gonapophyses which are much longer than the penis-guard which they subtend (see Plate XXI, fig. 78); these latter are flattened and blade-like, the apex produced into a point. Ninth sternite scarcely if at all notched medially beneath, the caudo-lateral angle beneath the pleurite with a broadly rounded lobe which is densely covered with tubercles bearing long yellowish hair, these tending to be contorted at their apices. Eighth sternite not projecting, the caudal margin straight or nearly so, bearing a tuft of long yellow hairs on either side, including two long, powerful, chitinized, decussate bristles.

Habitat.—Eastern United States.

Holotype, ♂, Kentucky.

Allotype, ♀, District of Columbia. (In copulation with one of the paratypes and pinned with it.)

Paratypes, 3 ♂'s, District of Columbia.

All of the types, with the exception of a paratype which has been retained, are in the collection of the Museum of Comparative Zoology, where they form part of the Loew collection.

Tipula loewiana sp. n.

Coloration light gray, the thorax marked with brown; male hypopygium with the ninth tergite small, the caudal margin with a V-shaped notch; the pleurite is produced caudad into a slight flattened expansion.

Male.—Length, 15 mm.; wing, 16.3 mm.

Frontal prolongation of the head long, pale brownish yellow, with a sparse whitish bloom. Palpi almost black. Antennæ with the three basal segments dull yellow, the remainder of the flagellum uniformly dark brownish. Head light gray with a subimpressed dark brown median vitta.

Pronotum pale, a little darkened on either side of the middle line. Mesonotal præscutum dull gray with darker brown vittæ, the median stripe divided into two by a very broad line of the ground color; lateral stripes indistinct; scutellum and postnotum much clearer gray. Pleura with the mesopleura clear light gray, the dorsal membrane and the metapleura dull yellow. Halteres yellow, passing into dark brown on the knob. Legs with the coxæ and trochanters dull light yellow, the former sparsely whitish pollinose; femora yellow, darkened at the apex; tibiæ and metatarsus yellowish brown, the segments a little darkened at the apex; remainder of the tarsi brown. Wings as in Plate XVI, fig. 12.

Abdomen with the sides of the first two tergites bright yellowish, the dorso-median line and the remaining tergites brown; segments with a broad lateral and a narrow caudal pale margin; hypopygium reddish; sternites brown, more yellowish laterally; segments three to five with a conspicuous caudal margin of the same color. Male hypopygium with the ninth tergite (see Plate XIX, fig. 51) rather small, subquadrate, narrowed apically, the caudal margin with a broad V-shaped notch whose edge is provided with a few chitinized tubercles; a shallow dorsal median groove. Ninth pleurite incomplete, indicated beneath, situated high up on the caudal face of the ninth sternite so that its inner dorsal angle about touches the ninth tergite; the caudal end of the pleurite is produced caudad into a flattened, subspatulate lobe (see Plate XX, fig. 67), in this suggesting the condition found in *T. macrolabis*, though to a very much lesser degree; a few scattered black hairs at the base of the sclerite on the outer side, outer pleural appendage a subcylindrical fleshy lobe with numerous long pale hairs; inner pleural appendage a flattened lobe which lies across the genital chamber, this bearing a sharp spine behind directed outward and a rounded concave lobe directed dorsad, the two being portions of a high dorsal crest of the appendage; cephalic arm of the appendage hidden beneath the ninth tergite. Ninth sternite with a deep V-shaped notch beneath, the ventro-median area pale, submembranaceous; at the lateral end of this notch and just below the pleurite is a papillose lobe directed inward

and bearing a dense tuft of long pale hairs at the apex, these tufts hanging pendulously in the notch of the sternite. Eighth sternite extensive, narrowed posteriorly, the caudal margin broadly U-shaped and bearing a long row of prominent yellow hairs on the edge.

Habitat.—Arctic America.

Holotype, ♂, Fort Resolution, Hudsons Bay Territory (Kennicott); in copulation with the allotype.

Allotype, ♀, topotypic.

Paratypes, 3 ♂'s, ♀, topotypic.

The type material is in the collection of the Museum of Comparative Zoology; paratypes in the collection of the author. The specimens bear the label No. 137 and the chirotypic name "*simplex*" in Loew's writing.

The species is dedicated to Dr. Hermann Loew.

Tipula mingwe sp. n.

Allied to *cincticornis*; color brownish yellow; size large; wings yellowish subhyaline with the vitreous lunate mark extending across the cell *1st M*₂ into cell *M*₄; male genitalia with the ninth tergite having the lateral lobes truncated, not pointed; ninth pleurite complete.

Male.—Length, 16 mm.; wing, 18 mm. Fore leg, femora, 9.2 mm. Hind leg, femora, 11.3 mm.; tibiae, 13.8 mm.

Female.—Length, 20 mm.; wing, 16.2 mm.

Frontal prolongation of the head rather long, yellowish brown; palpi elongate, brown. Antennae rather short, the first three segments yellowish brown, the remaining segments with about the basal quarter enlarged, dark brown, remainder of the segments medium brown, becoming darker on the terminal segments. Head light brown, rather broadly margined with yellowish along the posterior border of the eye.

Thoracic dorsum light yellowish brown with five distinct darker brown stripes, of which the median one is quite narrow, the next pair about as long, the more indistinct lateral stripes are shorter; scutum and scutellum yellowish brown; postnotum yellowish or greenish yellow. Pleura pale yellowish white. Halteres rather long, pale brown at the base, the knob dark brown. Legs with the coxæ densely clothed with pale hairs, yellowish; femora yellow, a little darkened at the tip; tibiae yellowish brown, darkened at the tip, the spurs long and slender; tarsi dark brown. Wings pale brownish to yellow subhyaline, the costal region more clearly yellow, the stigma brown; a whitish vitreous mark before the stigma extending from the end of cell *C* along the cord through cell *1st M*₂ far into

cell M_4 , sometimes indistinct and difficult to detect; veins dark brown. Venation (see Plate XVI, fig. 13): R_2 beyond cross-vein r long, persistent, much longer than R_{2+3} ; basal deflection of R_{4+5} nearly obliterated so that the radial sector is in a line with R_{4+5} .

Abdominal tergites with a dark brownish black, interrupted, dorso-median line; a much less distinct pale brown lateral stripe; ninth segment darker, brownish black; the caudal margin of the segments very indistinctly grayish; sternites pale brown. Male genitalia with the ninth tergite large, subquadrate, the caudal margin with a deep U-shaped notch, the lateral lobes subtruncate, not at all pointed. Ninth pleurite large, complete, with three appendages (see Plate XX, fig. 68) the outermost and most caudad is a flattened lobe which is narrowed into a sharp, curved point at the tip, the outer face of the blade of this appendage is densely provided with long, delicate, pale hairs; the next appendage consists of a broad foliaceous blade whose inner margin near the tip is prolonged into a short, black, heavily chitinized lobe and whose main portion is produced entad and cephalad into a conical lobe; the third appendage, which lies the furthest cephalad but is almost as far laterad in position as the first appendage, is a slender fleshy lobe which is densely provided with long, coarse, black hairs. Ninth sternite deeply and profoundly split medially, at its caudal angle bearing a short, fleshy pendulous appendage as in this and related groups of species in this genus. Eighth sternite with the caudal margin broadly concave, this concavity with about a dozen long hairs, the sides of the concavity with a bunch of about five long reddish hairs.

The female has the antennæ indistinctly bicolored, the bases of the individual segments only slightly darkened; in some specimens the thoracic stripes are quite indistinct; ovipositor with the upper valves broad at the base, rapidly tapering to the subacute slender point; lower valves shorter, compressed-flattened, blade-like, acute at the tip.

Habitat.—Northeastern United States.

Holotype, ♂, Bennett Lake, Hope Township, Hamilton Co., N. Y., altitude 1,500 feet, September 12, 1912 (Alexander).

Allotype, ♀, topotypic.

Paratypes, No. 1, ♂, Delaware Water Gap, Warren Co., N. J., July 9 (Johnson); No. 2, 2 ♂'s, Manlius, Onondaga Co., N. Y., August 20 (Comstock); No. 4, 2 ♂'s, topotypic; No. 6, 5 ♂ ♀, Plummer's Island, Maryland, July 21, 1915 (McAtee and Alexander); No. 11,

6 ♂ ♀, Scott's and Difficult Runs, Fairfax Co., Va., July 25, 1915 (McAtee and Alexander).

The specific name is that of the Delaware name for the Iroquois.

The type, allotype and paratypes Nos. 4, 5, 9, 10, 15 and 16 are in the collection of the author; paratype No. 1 in the collection of Mr. Johnson; paratypes Nos. 2 and 3 in the Museum of Comparative Zoology; the remaining paratypes in the United States Biological Survey collection.

There is a possibility that this may be *Tipula cincticornis* Doane, but the description of the latter implies that the outer lobes of the ninth tergite are acute as in *Tipula submaculata* Loew. Under these circumstances, the present insect must be considered to be distinct.

***Tipula monticola* sp. n.**

Coloration yellowish; antennæ bicolorous; head light gray; thoracic stripes quite indistinct, brownish orange; wings hyaline, the costal region yellowish; male genitalia with the ninth tergite large, the caudal margin deeply U-shaped, bearing a small lobe underneath, the lateral lobes of the tergite broad, the tip a slender, chitinized point; inner pleural appendage with the caudal arm pointed, the inner arm blade-like, draped on its outer face with a delicate ribbed membrane; eighth sternite with two great tufts of long silvery hairs.

Male.—Length, 17–18 mm.; wing, 18–19 mm.

Frontal prolongation of the head long, rather slender, dull yellow, a little gray above; palpi brown. Antennæ rather short, the three basal segments yellow, the remainder of the organ with the swollen bases of the segments dark brown, the stem yellow on the basal segments, soon passing into dark brown so that the terminal segments are unicolorous. Head light gray, a narrow blackish median vitta extending backward from the small frontal tubercle, becoming indistinct before the occiput.

Thoracic dorsum light grayish yellow, the præscutum with three brownish orange stripes, the median one broadest in front, more narrowed behind, split by a delicate brown median line on the anterior half; scutum light yellow with the disk of each lobe darker; scutellum light yellow with numerous, long, pale yellow hairs; postnotum pale yellow. Pleura pale yellow, whitish pollinose. Halteres light yellow, the knobs brown. Legs with the coxæ whitish pollinose; trochanters yellow; femora dull yellow, brown at the apex; tibiæ yellowish brown; tarsi light brown. Wings hyaline or

nearly so, the costal region light yellow, the stigma a little darker brown; a broad vitreous band before the stigma, along the cord and into cell *1st M*₂; a vitreous blotch beyond the stigma occupying most of cell *2nd R*₁. Venation as in Plate XVI, fig. 14.

Abdomen dull yellow without distinct stripes, the caudal margin of the tergites three to eight broadly margined with silvery; hypopygium reddish. Male genitalia with the eighth tergite rather broad, the margin being straight; ninth tergite (see Plate XIX, fig. 52) large, the caudal margin with a deep U-shaped notch which bears a small rounded median lobe beneath; the dorsal surface bears a broad median groove or depression to the base; the lateral lobes are broad, directed caudad, the tip a cylindrical chitinized point which is directed ventrad and slightly inward. Ninth pleurite (see Plate XVIII, fig. 35) large, prominent, oval, convex, not in contact with the ninth tergite; appendages two: outer appendage a long, cylindrical, fleshy lobe, subsigmoid, pale, covered with long divergent hairs; inner appendage complex (see Plate XX, fig. 69), composed of a caudal lobe which is directed backward, pointed, and a cephalic lobe which is compressed, black and heavily chitinized along the margin; on the outer face of this blade is a conspicuous membrane which is provided with numerous hair-like ribs. Ninth sternite extensive, convex, very deeply notched beneath and with a pair of very short fleshy lobes which bear dense tufts of long yellow hairs, each decussate with the tuft of the opposite side. Eighth sternite (see Plate XVII, fig. 26) large, prominent, projecting caudad, the posterior margin with a rounded notch which bears a dense tuft of long silvery white hairs on each side of the middle line.

Habitat.—Eastern United States.

Holotype, ♂, Woodworths Lake, Fulton Co., N. Y., altitude 1,600 feet, June 18, 1914 (Alexander).

Paratypes, No. 1, ♂, North Mt., Luzerne Co., Pa., June 8 (Johnson); No. 2, ♂, topotypic; No. 3, 3 ♂'s, Sacandaga Park, Fulton Co., N. Y., June 11, 1914 (Alexander); No. 6, 2 ♂'s, Indian Castle, Herkimer Co., N. Y., June 13, 1915 (Alexander).

The type and paratypes 2 to 7 in the collection of the author; paratype No. 1 in the collection of Mr. Johnson.

Tipula tuscarora sp. n.

Coloration yellowish; antennæ bicolorous; wings yellowish; thoracic stripes very indistinct; male genitalia with the ninth tergite very large, deeply notched, the lateral lobes produced into long, slightly curved horns; the outer pleural lobe is produced into

a very conspicuous curved hook; eighth sternite with two strong decurved bristles on the caudal margin.

Male.—Length, 16 mm.; wing, 17.2 mm.

Frontal prolongation of the head rather elongate, shining, dull yellow; palpi dull yellow, the two terminal segments brown. Antennæ short, the three basal segments yellow, remainder of the organ with the basal swelling of each segment brownish black, the remainder yellow, the two terminal segments a little darker. Head brownish yellow, an indistinct brown median line extending the length of the head.

Thoracic dorsum dull light yellow, unstriped or nearly so, the usual interspaces on the præscutum being a little more grayish only. Pleura yellow, sparsely whitish pollinose. Halteres rather long, slender, pale, the knobs darker. Legs with the coxæ and trochanters dull yellow, the remainder broken. Wings grayish yellow, the costal region and the stigma brighter yellow; an interrupted vitreous band before the stigma, broadest in cell *1st R*₁ before the stigma and in cell *1st M*₂, narrowly connecting the two along the cord; a small, indistinct, vitreous spot beyond the stigma. Venation as in Plate XVI, fig. 15.

Abdomen dull brownish yellow. Male genitalia (see Plate XVIII, fig. 36) with the eighth tergite prominent, its caudal margin straight across. Ninth tergite (see Plate XIX, fig. 53) very long, subquadrate, the caudal margin with a deep acute notch, the lateral lobes produced into long, somewhat curved horns which are directed slightly inward, the extreme tip ventrad. Ninth pleurite (see Plate XX, fig. 64) complete, rather small, the dorsal end sharply angular and barely attaining the ninth tergite; appendages two: a short, caudal-lying fleshy lobe with abundant long hairs (*a*), underneath the lobe is a large, powerful, chitinized hook directed dorsad and the tip outward, decussate with its mate of the opposite side; a flattened appendage lying more cephalad, its anterior face chitinized and notched; in a position of rest, the appendage lies beneath the extensive ninth tergite. Ninth sternite extensive, deeply notched beneath, bearing a fleshy, elongate-oval lobe which hangs subpendulously in the notch, but is attached to the sternite by one broad face. Eighth sternite (see Plate XVII, fig. 27) with the caudal margin broadly concave, at each end of this notch a single very large bristle, decussate with its mate of the opposite side. Penis-guard and the gonapophyses rather small, directed caudad, viewed from beneath (see Plate XXI, fig. 80) shaped somewhat like a trident.

Habitat.—Eastern United States.

Holotype, ♂. Glencarlyn, Fairfax Co., Va., June 21 (Knab).

Paratype, ♂, District of Columbia (Osten Sacken).

The type is in the collection of the United States National Museum, the paratype in the Museum of Comparative Zoology. The latter specimen is part of the Loew collection and bears the manuscript name "*hamata*" in Loew's writing; to the specimen Osten Sacken has added the following label: "Notice the small forceps below the large one."

The specific name adopted is that of the Indian tribe of the same title.

Tipula seminole sp. n.

Coloration yellowish, antennæ rather indistinctly bicolorous; thorax brownish yellow without distinct stripes in alcohol; wings pale yellow or brownish yellow, the costal area and the stigma darker. Male genitalia with the ninth tergite square, with a deep rectangular notch, the lateral lobes rounded.

Male.—Length, 12.5 mm.; wing, 12.6 mm.; antennæ about 4.6 mm.

Female.—Length, 23.5 mm.; wing, 15.8 mm.

Frontal prolongation of the head rather long, moderately slender, dull yellow, the palpi brownish yellow. Antennæ rather short, the first three segments yellow or yellowish, remainder of the antennæ with the basal enlargement dark brown, the remainder of each segment brownish yellow, this color darker on the terminal segments so that the color at this point is more unicolorous.

Thoracic dorsum brownish yellow without distinct stripes (in alcohol). Pleura dull yellow, indistinctly marked with brown. Halteres rather pale throughout. Legs with the coxæ and trochanters dull yellow, the femora similar, a little darkened at the tip; tibiæ and tarsi yellowish brown. Wings pale yellow or brownish yellow, the costal cell and the stigma more saturated, the latter rather indistinct; a vitreous mark before the stigma extending into cell *1st M*₂; veins brown. Venation as in Plate XVI, fig. 16.

Abdomen light yellow with a brown subbasal spot on the sides of the tergites, most distinct on segments two to five. Hypopygium of the male (see Plate XVIII, fig. 37) having the ninth tergite (see Plate XIX, fig. 54) square or nearly so, with a deep rectangular median notch on the caudal margin, the adjacent lobes obtusely rounded. Ninth sternite in contact with the ninth tergite, the pleurite complete or nearly so, the pleural suture being better indi-

cated beneath, shaped as a straight ventral line turned dorsad at its cephalic end almost at right angles to the ventral base line. Pleural appendages two, the outer appendage a short, rather stout, cylindrical lobe, pale and fleshy, which is provided with rather numerous hairs; inner pleural appendage, a flattened blade with the cephalic face notched and here with a shortened, finger-like lobe; the tip of this blade is quite pointed, chitinized; a triangular lobe from the ventro-caudal face of the pleura, this with numerous delicate pale hairs and a few short, stout ones. Ninth sternite with a shallow notch caudally, but not deeply incised. Eighth sternite (see Plate XVII, fig. 28) almost straight across the caudal margin with a small protuberance on either side of the middle line; a fringe of long hairs across the caudal margin, one or two on the outer side of the protuberance much stouter and curved. Penis-guard and the apophyses shaped as in Plate XXI, fig. 77.

Habitat.—Southeastern United States.

Holotype, ♂, St. Simons Island, Glynn Co., Ga., April, May, 1911 (J. Chester Bradley, coll.).

Allotype, ♀, topotypic.

Paratypes, 4 ♂'s, topotypic.

The types are in the Cornell University collection, paratypes in the collection of the author.

The specific name is that of the native Indian tribe formerly occupying Florida and the adjoining regions.

Tipula penicillata sp. n.

Coloration grayish; thoracic stripes distinct; wings light brown, the tip darker, a large vitreous spot before and beyond the stigma; male hypopygium enlarged, with a dense pencil of stiff yellow hairs on either side of the ninth sternite beneath.

Male.—Length, 12 mm.; wing, 12.6 mm. Fore leg, femora, 7.3 mm.; tibiae, 7.4 mm.

Frontal prolongation of the head rather long, shiny brownish yellow, the nasus short. Palpi dark brownish black. Antennae with the first scapal segment very long, about three times as long as the second segment; flagellar segments long cylindrical, the basal swelling inconspicuous; scape dull yellow, flagellum dark brown with a thick white pubescence. Head medium gray with an indistinct median brown suffusion.

Pronotal scutum gray, broadly brownish medially; scutellum dull yellow with a deep median notch. Mesonotal præscutum medium gray with dark brown stripes, the median one broad, conspicuous,

narrowly split by a pale middle vitta, lateral stripes quite indistinct; scutum yellowish brown with the lobes darker, grayish; scutellum yellowish brown; postnotum light gray. Pleura clear light gray, with the membranaceous area yellowish. Halteres rather short, brown, the knobs dark brown with the apex more yellowish. Legs with the coxæ brown with a sparse grayish bloom; trochanters dull yellow; femora brownish yellow, narrowly tipped with dark brown; tibiæ and tarsi brown. Wings light grayish brown, the costal region scarcely darker, the wing-apex darkened; stigma dark brown; a broad vitreous antestigmal band and a large vitreous spot beyond the stigma in the apex of cell second R_1 and base of cell R_2 .

Abdominal tergites one and two yellowish, the remaining tergites dark brown with a narrow dark brown median vitta; a narrow caudal margin of yellowish silver; sternites yellow with a broad median triangle on segments five to seven with the apex of the triangle at the caudal margin; segments eight and nine brownish yellow; hypopygium enlarged. Male hypopygium with the ninth tergite large, prominent, the dorsal surface flat or a little convex; the caudal margin with a very deep V-shaped notch, the lateral lobes a little produced on the outer side. Ninth sterno-pleurite somewhat restricted, the pleural suture not well indicated, the pleurite lying on the dorso-caudal face of the sternite; outer pleural appendage a very slender filiform lobe, fleshy, pale, with long hairs; inner pleural appendage complex, the caudal lobe produced into a slender curved hook which is bent upward; the inner lobe is flattened, the anterior margin blackened and heavily chitinized, deeply notched; the blade with a protecting mantle of delicate fine ribules (as in *monticola*). Ninth sternite darker colored than the pleurite and provided with a few scattered hairs, deeply notched medially; a stout pendulous lobe which bears a dense tuft or pencil of long reddish hairs, this pencil directed ventrad. Eighth sternite large, prominent, extending far caudad and its concavity forming a sheath for the base of the ninth sternite; the lateral angles bear dense tufts of long, stout, reddish-silvery hairs which are decussate; between these lobes a broad median projection whose lateral angles are slightly recurved and whose caudal margin is broadly concave; this latter lobe is hidden by the prominent tufts of hair.

Habitat.—Arctic America.

Holotype, ♂, Hudsons Bay Territory, Canada (Kennicott).

The type is in the collection of the Museum of Comparative Zoology, where the specimen bore in Loew's writing the name adopted herein.

Tipula rangiferina sp. n.

Coloration yellowish brown; antennal flagellum unicolorous; thorax without distinct stripes; lateral margin of the abdominal tergites with five brown spots; male genitalia with the ninth tergite broadly concave behind, the lateral angles produced into prominent blunt horns which suggest the budding horns of a stag.

Male.—Length, 13 mm.; wing, 13.5 mm.

Female.—Length, 16 mm.; wing, 14.7 mm.

Frontal prolongation of the head moderate in length, light brown, the nasus prominent; palpi light brown. Antennae with the three basal segments dull brownish yellow, the remainder of the flagellum almost black, each segment with a basal swelling, the segments with a whitish pubescence. Head dark gray.

Pronotum and the dorsum of the mesonotum light brown, without distinct darker markings. Pleura pale brownish yellow. Halteres long, rather slender, the stem pale, the knob brown. Legs with the coxae yellowish; the trochanters brownish yellow; femora yellowish brown, the tip dark brown; tibiae brownish yellow, the tip narrowly dark brown; tarsi brown. Wings light grayish; stigma distinct, light brown; a broad vitreous band before the stigma extending into cell M_4 ; a very small vitreous spot beyond the stigma in the base of cell R_2 ; veins brown. Venation as in Plate XVII, fig. 17.

Abdominal tergites brownish yellow, a little darker dorsally, each segment with the caudal margin silvery; tergite two with a large rounded spot on the side at about midlength; tergites three to six with this spot basal, conspicuous; apical tergites brownish, the hypopygium more reddish; sternites dull brownish yellow; the sclerites are provided with numerous scattered black hairs. Male genitalia (see Plate XVIII, fig. 38) with the eighth tergite broad, distinct for its entire width. Ninth tergite (see Plate XIX, fig. 55) extensive, the caudal margin deeply and broadly concave; the lateral angles produced into a blunt lobe whose tip is provided with four or five blunt tubercles which suggest the budding horns of a stag; the dorso-median area is broadly membranaceous. Ninth pleurite complete, but very small and restricted, consisting of a small oval lobe on the caudal face of the sternite; this sclerite is produced caudad into a flattened oblong point which bears on the inner face near the tip a sharp, triangular, chitinized tooth, directed inward and caudad; the outer face of this pleural projection is provided with from fifteen to eighteen coarse hairs; the pleural appendage (see Plate XX, fig. 70) is a conspicuous lobe, the anterior

portion of which is produced cephalad into a chitinized point which is deeply split by a notch; the upper point or lobule is a slender, chitinized, finger-like process, the lower lobule a rounded, chitinized ball; the posterior portion of this flattened lobe is produced into a chitinized point which is directed caudad and inward; the posterior margin and face of the appendage is densely provided with long coarse hair. Ninth sternite very extensive, almost continuous, but more membranaceous on the median line beneath; the caudal margin with a concave notch; on the sides of the notch, just ventrad of the pleurite, is a rounded knob which is densely provided with very long pale hair. Eighth sternite long, prominent, narrowed toward the apex whose caudal margin is gently concave and provided on either side of the median line with a tuft of long reddish hairs; ventral surface of the sclerite on the caudal half and along the margin with numerous stout, subappressed black hairs.

The female is similar to the male; the antennæ are shorter; ovipositor with the valves smooth, the tergal valves long, rather slender, rounded at the apex.

Habitat.—Northwestern United States.

Holotype, ♂, Beaver Creek, Montana; altitude 6,300 feet; August, 1913 (S. J. Hunter).

Allotype, ♀, topotypic.

Paratypes, 5 ♂'s, topotypic.

The types are in the collection of the University of Kansas, paratypes in the collection of the author.

Tipula mandan sp. n.

Coloration brownish gray; antennæ rather elongated, the three basal segments yellowish, the flagellum black; head gray with a delicate median brown vitta; thorax grayish with brown stripes; wings grayish hyaline with a brown stigma; abdomen yellowish with three dark brown stripes, of which the lateral pair are interrupted; male genitalia with the ninth tergite small, the caudal margin with a deep V-shaped notch; ninth pleurite produced caudad as a long spatulate point.

Male.—Length, 10.3–10.5 mm.; wing, 9.5–10 mm.

Female.—Length, 10.5 mm.; wing, 9–9.2 mm.

Frontal prolongation of the head dull yellowish, the nasus distinct; palpi with the two basal segments dull brownish yellow, the terminal segments brown. Antennæ with the two basal segments yellowish, the third segment brownish yellow; the remaining segments dark brownish black, the segments elongated, slightly enlarged basally

and covered with a dense whitish pubescence. Head light gray with a distinct dark brown median vitta.

Mesonotal præscutum dull brownish gray, the middle vitta broadly divided by a dull gray median stripe which is much broader than the brown margin enclosing it; lateral stripes rarely distinct; scutum dull brownish gray, the lobes a little more brownish medially; scutellum and postnotum yellowish gray with a narrow dark brown median stripe. Pleura light gray, the dorsal pleurites more yellowish. Halteres rather elongate, the stem somewhat pale, the knobs large, dark brown. Legs with the coxæ dull light yellow covered with a sparse white pollen; trochanters dull yellow; femora dull yellowish brown, the apices indistinctly darker brown; tibiæ brown, darkened at the apex; tarsi brown. Wings light gray; stigma distinct, dark brown; a pale vitreous band before the stigma, interrupted in the vicinity of cross-vein *r-m*; a vitreous spot beyond the stigma in cell *2nd R*₁. Venation as in Plate XVII, fig. 18.

Abdomen dull yellow, quite bright in places; a dorsal brown stripe which is almost continuous, interrupted only by a narrow silvery caudal margin to the individual segments; on the seventh to ninth segments this band is in some specimens more broadened out to cover the segment or nearly so; an interrupted brown stripe on the sides of the tergites, this consisting of a large brown blotch about midlength of each segment, on the seventh segment often becoming confluent with the dorsal stripe; sternites dull yellow. Male genitalia (see Plate XVIII, fig. 39) with the ninth tergite (see Plate XIX, fig. 56) small, subquadrate, much broader than long, the caudal margin with a deep V-shaped notch whose edge is chitinized and microscopically denticulate. Ninth pleurite incomplete, the pleural suture very short, the pleural region cylindrical, produced caudad and slightly entad as a long, slender lobe which is subspatulate; outer pleural appendage a very slender, elongate, cylindrical lobe, pale, with scattered black hairs; this appendage is directed dorsad with its tip close to the caudal margin of the ninth tergite; the second appendage (see Plate XX, fig. 71) is flattened, deeply bilobed, the outer lobe subcylindrical to somewhat flattened, chitinized especially along the margin; the inner lobe is very extensive, flattened, pale, with a somewhat blunt point directed laterad, the tip of the lobe with numerous hairs; third pleural appendage consisting of a compressed, flattened lobe, directed cephalad and dorsad, the apex strongly chitinized, black, divided into two lobules by a deep notch; the upper lobule cylindrical, smooth, the lower lobule with a few

parallel vertical ridges (see Plate XX, fig. 72). Ninth sternite extensive with a deep rounded emargination beneath, at the lateral end of this emargination a subtriangular to rounded lobe with abundant short pubescence; on either side of the middle line is a sharp chitinized point, hidden or nearly so by the brush on the eighth sternite. Penis-guard elongate, the sides subparallel, the ventral face at about midlength with a sharp point on either side, this point directed backward. Eighth sternite (see Plate XVII, fig. 29) with the caudal margin truncated or very slightly concave, with a brush of long yellow hairs on either side, these brushes connected by a few scattered hairs in between.

The female is similar to the male, but the antennæ are short, the four basal segments mainly yellowish, the remaining segments a little darkened at the base, the apical segments uniformly dark brown. Ovipositor with the tergal valves very short, stout, blunt at the apex; sternal valves very short, high, obliquely truncated (see Plate XXI, fig. 84).

Habitat.—Northwestern United States.

Holotype, ♂, Beaver Creek, Montana; altitude 6,300 feet; August, 1913 (S. J. Hunter).

Allotype, ♀, topotypic.

Paratypes, 14 ♂'s, 3 ♀'s, topotypic.

The types are in the collection of the University of Kansas, paratypes in the collection of the author.

The specific name is that of a Siouan tribe of Indians of the Northwest.

The only species with which this fly might be identified is *Tipula alta* Doane (*Annals of the Entomological Society of America*, V, 44, 1912) from Wyoming. There are many discrepancies between the descriptions of the two flies which lead me to believe that the present form is a distinct insect; the head is not brown, but gray, with a narrow brown median stripe; the lateral præscutal stripes are indistinct; the wings show a distinct vitreous spot beyond the stigma; the size is larger and the cell *1st M*₂ is not open (this open cell *1st M*₂ in *alta* is almost surely an abnormality of the type); the details of the genitalia are not as described for *alta*—the ninth pleurite is produced into a long spatulate point, the first appendage is an elongate, cylindrical, fleshy lobe, not small and spatulate; the inner appendage not at all as described for *alta*.

Tipula dietziana sp. n.

Coloration grayish; præscutum dull yellow with three brown

stripes; male hypopygium with the ninth tergite deeply notched medially; eighth sternite not armed with hair-bearing lobes.

Male.—Length, 14.2 mm.; wing, 17.2 mm.

Frontal prolongation of the head moderately long, pale brownish white above, brown on the sides, the nasus distinct. Palpi rather short, dark brown. Antennæ with the scapal segments dull brownish yellow, the third segment yellowish brown, darkest apically; the remaining segments of the flagellum dark brown; the basal enlargement brownish black, the terminal segments almost uniform in color; antennæ rather long and comparatively slender, if bent backward extending about to the base of the abdomen or a little beyond; segments of the flagellum with the basal portion only a little more enlarged than the pedicel; a dense white pubescence on the antennal segments. Head light gray with an indistinct median brown suffusion.

Mesonotal præscutum dull yellow with three broad brown stripes, of which the median one is indistinctly bisected by a paler median line, which in turn encloses a narrow dark brown median vitta; lateral stripes uniform in color, short, beginning far behind the pseudosutural foveæ; pseudosutural foveæ dark brownish black; scutum almost uniformly brown; scutellum and postnotum gray, the latter with a large brown spot on either side of the middle line. Pleura pale, rather densely light gray pruinose. Halteres rather long, light brown, more yellowish at the extreme base. Legs with the coxæ light brown, dusted with gray; trochanters dull yellow; femora brownish yellow, narrowly dark brown at the apex; tibiae light brown, tipped with darker, the tibial spurs light colored with the apical half chitinized, black; tarsi dark brown. Wings with a faint brownish suffusion, the costal cell more yellowish; stigma dark brown; a large vitreous spot beyond the stigma; a broad vitreous band before the stigma, brightest, almost white, as a spot beyond the apex of Sc_2 in cell *C* and in cell *1st R_1* (see Plate XVII, fig. 19).

Abdomen yellowish brown, the tergites with the lateral margins broadly pale, the caudal margins narrowly pale; a very indistinct interrupted sublateral stripe. Male hypopygium rather small. Ninth tergite (see Plate XIX, fig. 57) broadly transverse, the caudal margin with a broad, deep notch which bears at its base a depressed median tooth. Ninth pleurite incomplete, the suture only present beneath, though the outline of the sclerite is indicated throughout; the outer pleural appendage (see Plate XX, fig. 73) is slender at the

base, the distal portion spatulate, flattened; inner pleural appendage with the lower or caudal arm flattened, expanded at the apex, pale in color and directed almost dorsad; the surface of the arm is roughened, hairy; the upper or cephalic arm is flattened, chitinized. Ninth sternite with the caudal margin very gently concave medially, the caudo-lateral angles produced into rounded knobs which are produced into lobes on the ventral inner face, the lobes covered with long yellowish hairs; the ventral surface of the sternite rather extensive with a deep and broad median groove. Eighth sternite (see Plate XVII, fig. 30) small, the caudal margin gently concave medially, on each side with tufts of long yellow hairs which are decussate.

Habitat.—Eastern United States.

Holotype, ♂, District of Columbia.

Allotype, ♀, Plummer's Island, Md., April 25, 1915 (McAtee).

Paratype No. 1, ♂, topotypic; No. 2, ♂, Plummer's Island, Md., April 25, 1915 (McAtee); No. 3, 2 ♂'s, with the last on April 28, 1915; No. 5, ♂ ♀, Maryland, near Plummer's Island, April 28, 1915; No. 7, ♂ ♀, Virginia, near Plummer's Island, April 28, 1915.

The type is in the collection of the Museum of Comparative Zoology; paratypes 1, 2, 5 and 7 in the collection of the author; the remaining paratypes and the allotype in the collection of the Biological Survey. The material on which the species is partly based is from the Loew-Osten Sacken collection and was probably taken in the vicinity of Washington by Osten Sacken.

T. dietziana is respectfully dedicated to Dr. William G. Dietz.

The species is closely allied to *T. australis* Doane and may be separated from that species by means of the following key:

1. Antennæ short, the flagellar segments deeply constricted beyond the basal enlargement; six brown stripes on the mesonotal præscutum; male hypopygium with the ninth tergite almost straight across the caudal margin with a deep and narrow impressed median furrow; ninth pleurite distinctly complete; lobes of the caudo-lateral angles of the ninth sternite, pendulous, directed ventrad, the apex clothed with short golden hairs; eighth sternite with four conspicuous lobes, the outer pair very broad and flattened, their apex oblique; the inner pair of lobes are the divaricate ends of a median process on the caudal margin of the sternite, their apices clothed with a dense brush of golden yellow hair.....*australis* Doane.⁸

⁸*australis* Doane; *Journal of the New York Entomological Society*, vol. 9, No. 3, pp. 104, 105; 1901.

Antennæ longer, the flagellar segments not constricted beyond the basal enlargement; three brown stripes on the mesonotal præscutum; male hypopygium with the ninth tergite having the caudal margin deeply and broadly notched medially; ninth pleurite incomplete; lobes of the caudo-lateral angles of the ninth sternite not pendulous, directed entad; eighth sternite without lobes on the caudal margin*dietziana* sp. n.

Tipula cunctans Say.

Tipula cunctans Say; Journal of the Academy of Natural Sciences of Philadelphia, vol. 3, p. 23 (1823).

Tipula casta Loew; Entomologische Zeitschrift, vol. 7, p. 289 (1863).

Tipula infuscata Loew; Entomologische Zeitschrift, vol. 7, p. 289 (1863).

There can be no doubt but that the three names given above represent one and the same species. Under the series of *cunctans* determined as such by Loew, there appears a specimen which bears a manuscript label in Loew's writing and this label is "*infuscata*." The type-series of *casta* and *infuscata*, as well as the series of *cunctans*, all bear the same manuscript number given to the specimens by Osten Sacken (No. 95). In the series of *Tipula cunctans* there are two females dated October 20; it is well known that *infuscata* is one of the few autumnal species of Nearctic *Tipula*, and this data in regard to *cunctans* only confirms the synonymy of the species.

THE BICORNIS GROUP.

The small group of species that constitute this division seem to show the following characters and tendencies: The nasus is very short to indistinct; the coloration is yellow or brownish yellow with the thoracic stripes usually distinct; the body is provided with abundant short hairs on the head and on the thoracic interspaces. The venation shows the cell *1st M*₂ very small and pentagonal (larger and more elongated in *johnsoniana*). The male hypopygium has the ninth tergite tumid (very slightly so in *parshleyi*), unarmed or provided with horns (unarmed in *johnsoniana*; two horns in *bicornis* and *morrisoni*; four horns in *megaura*); the ninth pleurite complete; the outer pleural appendage tending to be reduced to a very tiny lobe; the inner pleural appendage large, elongate to subquadrate; the gonapophyses subtending the penis-guard, and about half its length (in *morrisoni*, *megaura*, etc.) to fully the length of the penis-guard (in *johnsoniana*). The female ovipositor with the valves short, blunt and subfleshy, little chitinized. Our species may be separated in the male sex by the following key:

1. Ninth tergite not tumid; eighth sternite very long, sheathing the ninth sternite beneath, the tip with two chitinized points on each side*parshleyi* sp. n.

- Ninth tergite tumid; eighth sternite shorter, not closely applied to the ninth sternite for the entire length of the latter, the tip without chitinized points.....2
2. Ninth tergite with four lobes or horns.....*megaura* Doane.⁹
Ninth tergite with two or no horns.....3
3. No horns on the tergite.....*johnsoniana* sp. n.
With horns on the tergite.....4
4. The horns on the tergite directed upward*bicornis* Forbes.¹⁰
The horns on the tergite directed caudad or slightly ventrad,
morrisoni sp. n.

The Palæartic *Tipula fascipennis* Meigen (1818) was the first described species of this group and should probably give the name to the group. The Nearctic groups of the genus should be correlated with the Palæartic species.

Tipula johnsoniana sp. n.

Coloration light yellow, the thoracic stripes grayish brown; antennal flagellum uniformly brown; male hypopygium with the ninth tergite tumid without processes; ninth pleurite produced into a broad flattened process.

Male.—Length, 17.5 mm.; wing, 19 mm.

Frontal prolongation of the head rather short, with numerous short black hairs on the dorsal and lateral surfaces; nasus indistinct. Palpi light brown. Antennæ rather long, much longer than in the related *bicornis* Forbes; the flagellar segments are slightly swollen basally; the scapal segments and the basal half to two-thirds of the third segment dull yellow, the remainder of the appendage dark brown. Head rich brownish yellow with abundant short black hairs scattered over the dorsal surface.

Pronotal scutum yellowish brown with an indistinct brownish spot on the side of the sclerite. Mesonotal præscutum light yellow with three grayish brown stripes, of which the median one is broadest and longest; the interspaces between the stripes are provided with numerous long yellowish hairs; scutum, scutellum and postnotum dull brownish yellow. Pleura pale yellow, thickly whitish pollinose; trochanters dull yellow; femora yellow with the apex narrowly dark brown; tibiæ brown, the apex obscurely darker; tarsi brown. Wings with a slight grayish tinge, more yellowish in the costal region and in cell *M* adjoining vein *Cu*; stigma dark brown; a conspicuous

⁹*megaura* Doane; *Journal of the New York Entomological Society*, vol. 9, No. 3, pp. 112, 113; 1901.

¹⁰*bicornis* Forbes; *Sixteenth Report State Entomologist of Illinois*, p. 78, Plate 6, fig. 4; 1891.

vitreous spot before the stigma extending from cell *1st R*₁ into the base of cell *M*₄. Venation as in other members of the *bicornis* group, but the cell *1st M*₂ is large and less regularly pentagonal (see Plate XVII, fig. 20).

Abdominal tergites bright yellow; a narrow median brown vitta beginning on the base of segment two extending through segment six; segments seven and eight yellow, indistinctly brown medially; the ninth tergite is dark brown, pale medially on the caudal half above; an indistinct sublateral band beginning midlength of the second segment, ending on the seventh segment, on the last three segments oblique; lateral margins broadly, caudal margins narrowly yellowish silvery; sternites dull yellow, narrowly margined with silvery; ninth pleurite and sternite dark brown. Male hypopygium (see Plate XVIII, fig. 40) with the ninth tergite (see Plate XIX, fig. 58) tumid, though not very high, the caudal margin almost transverse with an indistinct median impression; no horns or lobes on the tergite; the ventro-caudal margin on either side of the middle line is produced into a flattened edge whose inner angle is blackened, chitinized, and sparsely denticulate. Ninth pleurite complete, extensive; the caudal margin is produced into a broad, flattened process directed caudad and slightly dorsad and entad; outer pleural appendage small but prominent for this group of species, elongate-cylindrical, pale with a few scattered long hairs; inner pleural appendage a flattened blade which is broad basally, narrowed into a subacute point, the caudal margin ciliate with long yellow hairs. Ninth sternite extensive, the dorso-caudal angle produced entad and slightly ventrad; this process subacute and slightly chitinized; beneath this a shorter lobe with a fringe of long yellow hairs, those at the distal end curled and twisted. The gonapophyses are very long, subequal to the penis-guard which they subtend; the tips of the gonapophyses slightly divaricate, the distal two-thirds with a fringe of stout yellow hairs on the ventral face. Eighth sternite extensive, the caudal margin subtransverse with four slight tubercles, each bearing a dense tuft of long yellow hairs; the lateral brushes surround a powerful decussate reddish bristle.

Habitat.—Northeastern United States.

Holotype, ♂, Dummerston, Vermont; July 14, 1908 (Johnson).

The type is in the collection of the Boston Society of Natural History.

The species is dedicated very respectfully to Mr. Charles W. Johnson, the collector of the type specimen.

Tipula morrisoni sp. n.

Coloration yellowish; antennæ indistinctly bicolorous; thorax with the stripes rather indistinct; male genitalia enlarged, the ninth tergite very high and tumid, with a deep V-shaped notch; ventro-caudal margin of the segment with two chitinized, denticulate lobes; gonapophyses powerful; eighth sternite with a dense brush of long pale hairs.

Male.—Length, 13–14 mm.; wing, 18–18.5 mm.

Female.—Wing, 15 mm.

Frontal prolongation of the head moderately long, dull yellow; palpi light brown. Antennæ rather short, if bent backward extending about to or slightly before the base of the wings; the basal segments brownish yellow, the flagellum indistinctly bicolorous, the bases of the segments being dark brown, the remainder yellowish brown; the flagellar segments are only a very little constricted beyond the base. Head pale grayish brown with a narrow brown median line, more distinct behind.

Thoracic dorsum dull light yellow or brownish yellow, the præscutal median stripe very broad but relatively indistinct, brownish; scutum with the lobes a little darker than the pale median area; thorax rather densely provided with pale hairs. Pleura whitish pollinose, unmarked. Halteres rather pale, the knob a little darker. Legs with the coxæ whitish pollinose; trochanters yellowish; remainder of the legs light brown, the apices of the segments scarcely darker. Wings subhyaline, the costal cell brown, the stigmal spot rather extensive, brown; an extensive vitreous band before the stigma in cell *1st R*₁, extending beyond cell *1st M*₂. Venation as in Plate XVII, fig. 21.

Abdominal tergites dull yellow; a brown median vitta which is barely indicated on segment one, extending the entire length of segment two, on segments three and four broadening out to include most of the dorsum; segments five to eight with the median mark again narrowed; segments margined with silvery, this mark broad laterally, very narrow caudally; the sternites pale. Male genitalia (see Plate XVIII, fig. 41) with the eighth tergite very narrow. Ninth tergite exceedingly tumid, very high, the caudal margin with a deep V-shaped notch, the lateral lobes thus formed directed caudad and slightly dorsad; the segment is dark brown, the margin pale whitish, the brown continuing up to the apices of the lobes and as a narrow line to the ventro-caudal margin of the segment on the caudal face; a narrow brown line running obliquely from underneath the

lobes to the middle line beneath; the ventro-caudal edge of the ninth tergite is concave and with an oval notch, the lobes thus formed (see Plate XXI, fig. 83) directed entad, ventrad and slightly caudad, heavily chitinized, minutely denticulate and provided with a few long hairs. Ninth pleurite complete, rather large, subquadrate, the dorso-caudal angle produced caudad and slightly dorsad and entad; lobes two, flattened, fleshy, with numerous long hairs. Ninth sternite rather restricted, the caudal margin beneath broadly concave, the lateral lobes prominent, directed entad and caudad, the tips expanded, truncate, the lobe with numerous long pale hairs on the inner margin; immediately dorsad of this lobe is a small rounded knob bearing numerous hairs; in a position of rest this knob is invisible from beneath. Gonapophyses powerful (see Plate XXI, fig. 82) directed caudad and slightly dorsad; they occupy the ventral portion of the genital chamber, each one consisting of a cylindrical, heavily chitinized horn, slightly divergent apically; a narrow line of short strigose hairs on the outer face of each horn. Eighth sternite large, the caudal margin truncated medially and here with a dense brush of long pale hairs.

The female is in the Loew collection and bears the label in Osten Sacken's writing: authentic ♀, caught with the ♂, from Delaware. The female is quite small, the wing measuring but 15 mm. The abdomen of the allotype is broken off, but another specimen comes close to *bicornis* in the very short valves to the ovipositor.

Habitat.—Eastern United States.

Holotype, ♂, Oaklandon, Hancock Co., Ind., June 8, 1913 (Morrison).

Allotype, ♀, Delaware.

Paratypes, No. 1, 2 ♂'s, Agricultural College, Lowndes Co., Miss., April 9, 1908 (Kimbrow); No. 3, ♂, Fort Washington, Prince George Co., Md., May 26, 1896 (Johnson); No. 4, 5 ♂'s, 1 ♀, District of Columbia (Osten Sacken); No. 10, ♂, Rhode Island (Johnson); No. 11, ♂, Shiloh, New Jersey, June 19, 1915 (Alexander); No. 12, 4 ♂'s, Four-mile Run, Fairfax Co., Va., May 31, 1914 (McAtee).

Type and paratypes 1, 2 and 11 in the collection of the author; allotype and paratypes 4 to 9 in the Museum of Comparative Zoology; paratype 3 in the collection of Mr. Johnson; paratype 10 in the collection of the Boston Society of Natural History; Nos. 12 to 15 in the collection of the Biological Survey.

This interesting crane-fly is dedicated to my friend and companion, Mr. Harold Morrison.

Tipula megaura Doane.

Tipula megaura Doane; Journal of the New York Entomological Society, vol. 9, No. 3, pp. 112, 113; 1901.

Coloration pale brownish yellow, the thoracic stripes reddish brown; antennal flagellum uniform in color or nearly so; male hypopygium with the ninth tergite tumid, produced into four subequal teeth; ninth pleurite produced into two subchitinized processes.

Male.—Length, 12.7 mm.; wing, 14.6 mm.

Frontal prolongation of the head moderately long, with abundant long black hair above; nasus not evident. Palpi light brown. Antennæ rather short, the segments uniformly light brownish yellow. Head pale brownish yellow, sparsely grayish pruinose with a broad median depression; head with numerous scattered black hairs.

Thoracic dorsum pale brownish yellow with three light reddish brown stripes, the median one broad, split by a narrow vitta of the ground color; scutum with the lobes light brown; scutellum and postnotum yellowish. Pleura yellowish, thickly dusted with a bluish white pollen. Halteres pale, the knobs dark brown. Legs with the coxæ pale yellow, bluish white pruinose; trochanters yellow; femora light brown, rather broadly tipped with darker; tibiæ and tarsi brown. Wings pale brownish yellow, the costal cell more saturated, yellowish; a vitreous antestigmal blotch, interrupted near the fork of the sector, most distinct along the cord and completely filling the small cell *1st M*₂; veins dark brown (see Plate XVII, fig. 22).

Abdominal tergites brownish yellow, with the caudal margin narrowly, the lateral margin broadly bordered with silvery; a broad dorsal median stripe extending the length of the abdomen; sternites dull yellow, the caudal margins of the segments narrowly silvery. Male hypopygium (see Plate XVIII, fig. 42) with the ninth tergite (see Plate XIX, fig. 59) tumid as in most of this group of species, the posterior margin produced caudad and dorsad into a stout median lobe which bears two subequal, slightly divaricated lobules which are not blackened or chitinized; on the caudal face of the segment a tooth on either side of the median line, this directed caudad and slightly ventrad; the upper pair of teeth or lobules are smooth, but covered with a dense whitish pubescence; the lower pair which are a little more widely separated are covered with scattered setigerous tubercles; the ventral outer edge of the segment bears a broad, subchitinized (but not blackened except underneath) lobe on either side of the middle line, this lobe bifid, the proximal arm roughened,

hairy, the distal arm long, slender, subcylindrical. Ninth pleurite rather extensive, the caudal margin produced into two prominent flattened processes, the more dorsal curved toward the tip, the more ventral subspatulate, straight; outer pleural appendage very tiny and reduced, occupying the notch between the tergite and pleurite, fleshy and bearing a few long hairs at the tip; inner pleural appendage elongate, slightly curved, with numerous long hairs on the outer face. Ninth sternite with the dorso-caudal angle produced inward as a long, flattened process which approaches the one of the opposite side on the middle line beneath. The gonapophyses are powerful and divaricated, of the same structure as in *T. morrisoni*. Eighth sternite extensive, the caudal margin indistinctly trilobed, the median area broadly convex and bearing a dense fringe of long reddish hairs; on either side smaller lobes also bearing long hairs.

Habitat.—Northern United States.

♂, Norwich, Vermont; July 8, 1908 (Johnson); 2 ♂'s, 1 ♀, Battle Creek, Michigan (Aldrich).

Tipula parshleyi sp. n.

Coloration dull yellow; antennæ with the basal flagellar segments bicolorous; thoracic stripes indistinct; body with numerous short hairs; male genitalia with the eighth sternite large, enclosing the ninth sternite in its concavity.

Male.—Length, 14.5–15 mm.; wing, 15.2–16.4 mm.; antennæ about 4.6 mm. Fore leg, femora, 9.6 mm.; tibiæ, 11.6 mm.; middle leg, femora, 8.8–9.5 mm.; tibiæ, 9.8–10.3 mm.; hind leg, femora, 8.8–10.2 mm.; tibiæ 10.1–12 mm.

Female.—Length about 15 mm.; wing, 17.5 mm.

Frontal prolongation of the head dull yellow, palpi short, dull brownish yellow. Antennæ with the two basal segments yellow, the third segment almost cylindrical, dull yellow, remaining segments of the flagellum constricted, the basal swelling dark brown, the remainder of each segment dull yellow, toward the tip of the antennæ becoming darker, brownish. Head light yellow.

Thoracic dorsum light yellow with three dark orange to brown stripes, the middle one broadest in front, narrowed behind, indistinctly divided by a median line; lateral stripes narrow; the thoracic dorsum is provided with numerous tiny hairs except in the area covered by the stripes which are destitute of these setigerous punctures; scutum dull yellow, each lobe with two orange or brown blotches, the larger one lying caudad and proximad, the smaller one cephalad and distad; scutellum and postnotum dull yellow, sparsely

provided with tiny hairs. Pleura very pale with a thick whitish bloom. Halteres pale at the base, the knob dark brown. Legs with the coxæ pale, whitish pollinose; trochanters dull yellow; femora and tibiæ brownish yellow; tarsi brownish. Wings whitish, subhyaline, the costal cell yellowish, the stigma rather indistinct, dull yellow. Venation as in Plate XVII, fig. 23.

Abdominal tergites dull yellow to brown, densely provided with short hairs; eighth segment black; ninth segment reddish brown at the base on either side, dark brownish black on the caudal half; sternites dull yellow, the massive eighth sternite orange-brown. Hypopygium of the male (see Plate XVIII, fig. 43) with the eighth tergite small, rather narrow. Ninth tergite (see Plate XIX, fig. 60) rather small, quadrate, the outer lateral angles produced caudad into prominent sharp points; the caudal margin of the segment with three lobes, of which the median one is smallest. Ninth pleurite complete but rather narrow, the appendages complex, the inner lobe ending in a compressed flattened arm which is produced into a cephalad-directed point; behind this last lobe is a second one, shorter, more cylindrical, feebly tuberculate, provided with many long hairs. Eighth sternite very large, almost completely enveloping the ninth sternite which lies in its concavity; this segment is provided with abundant rather short pale hairs; at the end on either side with two slender, cylindrical chitinized points; the space between them on the caudal margin with a dense brush of short hairs. Ninth sternite with a chitinized appendage at the tip, this being shaped as in Plate XX, fig. 74; it is slender, expanded at the tip and ending in a long, slightly curved point which is surrounded by a few blunt teeth; the inner face is provided with numerous long hairs directed mesad.

Female.—Similar to the male, even in the rather peculiar venation; antennæ short, the extreme base of each flagellar segment dark, the remainder with a whitish bloom. Ovipositor with the valves very shortened (see Plate XXI, fig. 87) somewhat fleshy, as in *bicornis et al.*; tergal valves separated by a deep notch, the lobes with a short, thick, grayish pubescence and a few longer yellow hairs; sternal valves yellowish with a thick yellowish white pubescence.

Habitat.—Northeastern United States and Canada; Colorado.

Holotype, ♂, Orono, Penobscot Co. Me., June 6, 1913 (Alexander and Parshley).

Allotype, ♀, Dorchester, Suffolk Co., Mass., No. 482 (Uhler).

Paratypes, No. 1, 5 ♂'s, topotypic; No. 6, ♂, Cambridge, Middlesex Co., Mass., No. 482; No. 7, 2 ♂'s, Woburn, Middlesex Co., Mass.

(Shute); No. 9, ♂, Dorchester, Suffolk Co., Mass., No. 482 (Uhler); No. 10, ♂, Eastport, Washington Co., Me., July 15 (Johnson); No. 11, ♀, Barber Dam, New Brunswick, June 25, 1914 (McKenzie); No. 12, ♂, Frederickton, New Brunswick, June 10, 1914 (Tothill); No. 13, ♂, British America (Scudder); No. 14, ♂, Colorado (H. K. Morrison).

Paratype No. 6 bears the label "*scaphula*" in Loew's script.

The type and paratypes 1 to 5 are in the collection of the author; the allotype and paratypes 6 to 9 and 13 in the Museum of Comparative Zoology; paratype 10 in the Boston Society of Natural History; paratypes 11 and 12 in the New Brunswick Experiment Station; paratype 14 in the United States National Museum.

This species is dedicated to my friend and companion, Mr. Howard S. Parshley.

Many specimens, including the type, were taken along the Penobscot River near the Basin Mills during the twilight and early evening. The flies were on the wing and quite active.

EXPLANATION OF PLATES XVI-XXI.

PLATE XVI.—WING-VENATION.

- Fig. 1.—Wing of *Nephrotoma penumbra*; R_1, R_2, R_3 , etc. = radial veins; M_1, M_2, M_4 = medial veins; Cu_2 = cubitus 2; 2nd A = second anal.
- Fig. 2.—Wing of *Tipula (Cinctotipula) algonquin*.
- Fig. 3.— " " *T. pachyrhinoïdes*.
- Fig. 4.— " " *T. penobscot*.
- Fig. 5.— " " *T. mainensis*.
- Fig. 6.— " " *T. kennicotti*.
- Fig. 7.— " " *T. taughannock*, ♀.
- Fig. 8.— " " *T. taughannock*, ♂.
- Fig. 9.— " " *T. imperfecta*.
- Fig. 10.— " " *T. cayuga*.
- Fig. 11.— " " *T. triton*.
- Fig. 12.— " " *T. loewiana*.
- Fig. 13.— " " *T. mingwe*.
- Fig. 14.— " " *T. monticola*.
- Fig. 15.— " " *T. tuscarora*.
- Fig. 16.— " " *T. seminole*.

PLATE XVII.—WING-VENATION AND HYPOPYGIAL STRUCTURES.

- Fig. 17.—Wing of *T. rangiferina*.
- Fig. 18.— " " *T. mandan*.
- Fig. 19.— " " *T. dietziana*.
- Fig. 20.— " " *T. johnsoniana*.
- Fig. 21.— " " *T. morrisoni*.
- Fig. 22.— " " *T. megaura*.
- Fig. 23.— " " *T. parshleyi*.
- Fig. 24.—Ninth sternite of *T. algonquin*; ventral aspect.
- Fig. 25.— " " *T. cayuga*; ventral aspect.
- Fig. 26.—Eighth " " *T. monticola*; ventral aspect.
- Fig. 27.— " " *T. tuscarora*; ventral aspect.
- Fig. 28.— " " *T. seminole*; ventral aspect.
- Fig. 29.— " " *T. mandan*; ventral aspect.
- Fig. 30.— " " *T. dietziana*; ventral aspect.

PLATE XVIII.—HYPOPYGIAL STRUCTURES.

Fig. 31.—	Lateral aspect of the hypopygium of	<i>T. mainensis.</i>
Fig. 32.—	“ “ “ “ “ “	“ <i>T. penobscot.</i>
Fig. 33.—	“ “ “ “ “ “	“ <i>T. taughannock.</i>
Fig. 34.—	“ “ “ “ “ “	“ <i>T. kennicotti.</i>
Fig. 35.—	“ “ “ “ “ “	“ <i>T. monticola.</i>
Fig. 36.—	“ “ “ “ “ “	“ <i>T. tuscarora.</i>
Fig. 37.—	“ “ “ “ “ “	“ <i>T. seminole.</i>
Fig. 38.—	“ “ “ “ “ “	“ <i>T. rangiferina.</i>
Fig. 39.—	“ “ “ “ “ “	“ <i>T. mandan.</i>
Fig. 40.—	“ “ “ “ “ “	“ <i>T. johnsoniana.</i>
Fig. 41.—	“ “ “ “ “ “	“ <i>T. morrisoni.</i>
Fig. 42.—	“ “ “ “ “ “	“ <i>T. megaura.</i>
Fig. 43.—	“ “ “ “ “ “	“ <i>T. parshleyi.</i>

PLATE XIX.—HYPOPYGIAL STRUCTURES.

8s = eighth sternite; 9s = ninth sternite; 9t = ninth tergite.

Fig. 44.—	Dorsal aspect of the ninth tergite of	<i>T. algonquin.</i>
Fig. 45.—	“ “ “ “ “ “	“ <i>T. penobscot.</i>
Fig. 46.—	“ “ “ “ “ “	“ <i>T. mainensis.</i>
Fig. 47.—	“ “ “ “ “ “	“ <i>T. taughannock.</i>
Fig. 48.—	“ “ “ “ “ “	“ <i>T. kennicotti.</i>
Fig. 49.—	“ “ “ “ “ “	“ <i>T. cayuga.</i>
Fig. 50.—	“ “ “ “ “ “	“ <i>T. triton.</i>
Fig. 51.—	“ “ “ “ “ “	“ <i>T. loewiana.</i>
Fig. 52.—	“ “ “ “ “ “	“ <i>T. monticola.</i>
Fig. 53.—	“ “ “ “ “ “	“ <i>T. tuscarora.</i>
Fig. 54.—	“ “ “ “ “ “	“ <i>T. seminole.</i>
Fig. 55.—	“ “ “ “ “ “	“ <i>T. rangiferina.</i>
Fig. 56.—	“ “ “ “ “ “	“ <i>T. mandan.</i>
Fig. 57.—	“ “ “ “ “ “	“ <i>T. dietziana.</i>
Fig. 58.—	“ “ “ “ “ “	“ <i>T. johnsoniana.</i>
Fig. 59.—	“ “ “ “ “ “	“ <i>T. megaura.</i>
Fig. 60.—	“ “ “ “ “ “	“ <i>T. parshleyi.</i>

PLATE XX.—HYPOPYGIAL STRUCTURES.

Fig. 61.—	Pleural appendages of <i>T. algonquin</i> ; lateral aspect.
Fig. 62.—	Ninth pleuro-sternite of <i>T. taughannock</i> ; ventral aspect; <i>a</i> = fleshy lobe.
Fig. 63.—	Pleural appendages of <i>T. cayuga</i> ; lateral aspect; <i>d</i> = dorsal arm; <i>v</i> = ventral arm.
Fig. 64.—	Pleurite of <i>T. tuscarora</i> ; ventral aspect.
Fig. 65.—	Outer pleural appendage of <i>T. triton</i> ; lateral aspect.
Fig. 66.—	Apex of inner pleural appendage of <i>T. triton</i> ; lateral aspect from the inside.
Fig. 67.—	Pleurite of <i>T. loewiana</i> ; lateral aspect.
Fig. 68.—	Pleural appendages of <i>T. mingwe</i> ; lateral aspect.
Fig. 69.—	Inner pleural appendage of <i>T. monticola</i> ; lateral aspect.
Fig. 70.—	Inner pleural appendage of <i>T. rangiferina</i> ; lateral aspect.
Fig. 71.—	Second pleural appendage of <i>T. mandan</i> ; lateral aspect.
Fig. 72.—	Inner pleural appendage of <i>T. mandan</i> ; lateral aspect.
Fig. 73.—	Outer pleural appendage of <i>T. dietziana</i> ; lateral aspect.
Fig. 74.—	Appendages on the tip of the ninth sternite of <i>T. parshleyi</i> ; lateral aspect.

PLATE XXI.—HYPOPYGIAL STRUCTURES.

Fig. 75.—	Penis-guard of <i>T. mainensis</i> ; ventral aspect.
Fig. 76.—	Apex of the inner pleural appendage of <i>T. mainensis</i> ; lateral aspect.
Fig. 77.—	Penis-guard and gonapophyses of <i>T. seminole</i> ; lateral aspect.
Fig. 78.—	Gonapophyses of <i>T. triton</i> ; lateral aspect.
Fig. 79.—	Penis-guard of <i>T. triton</i> ; lateral aspect.

- Fig. 80.—Penis-guard of *T. tuscarora*; ventral aspect.
Fig. 81.—Penis-guard of *T. rangiferina*; lateral aspect.
Fig. 82.—Gonapophyses of *T. morrisoni*; ventral aspect.
Fig. 83.—Ventre-caudal margin of the ninth tergite of *T. morrisoni*; caudal aspect.
Fig. 84.—Ovipositor of *T. mandan*; lateral aspect. *9t* = ninth tergite; *9s* = ninth sternite.
Fig. 85.—Ovipositor of *T. piliceps*; dorsal aspect.
Fig. 86.—Ovipositor of *T. imperfecta*; dorsal aspect.
Fig. 87.—Ovipositor of *T. parshleyi*; dorsal aspect.